THE IRON AGE

A Review of the Hardware, [illegible] Machinery and Metal Trades.

Published every Thursday Morning by [illegible], 14-16 Park Place, New York.

Vol. 77: No. 2. *New York, Thursday, January 11, 1906.*

$5.00 a Year, including Postage.
Single Copies, 15 Cents.

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The Pearson Type Casting Machine.

A Simple Machine for Composing Advertising Matter.

It is said that no composing machine now on the market completely fills the requirements of the printer, as a large amount of hand setting is necessary in every printing office. For straight matter there are a number of excellent machines, but irregular work requiring frequent changes of type face must still be done by hand. In the latter class may be included medical, astronomical and other technical books, law briefs in which full face and italic types are required and marginal notes are used, and above all advertising matter which, for artistic reasons and to attract attention, must have individual words and sentences set with type differing from the rest of the matter. Another objection to the composing machines now sold is that they are too complicated and expensive for use in small printing offices. A new casting and composing machine, invented by John R. and Gustave A. Pearson, aims to meet the requirements of irregular and intricate work, particularly advertising matter, and is so simple that it can be brought within the reach of every printer.

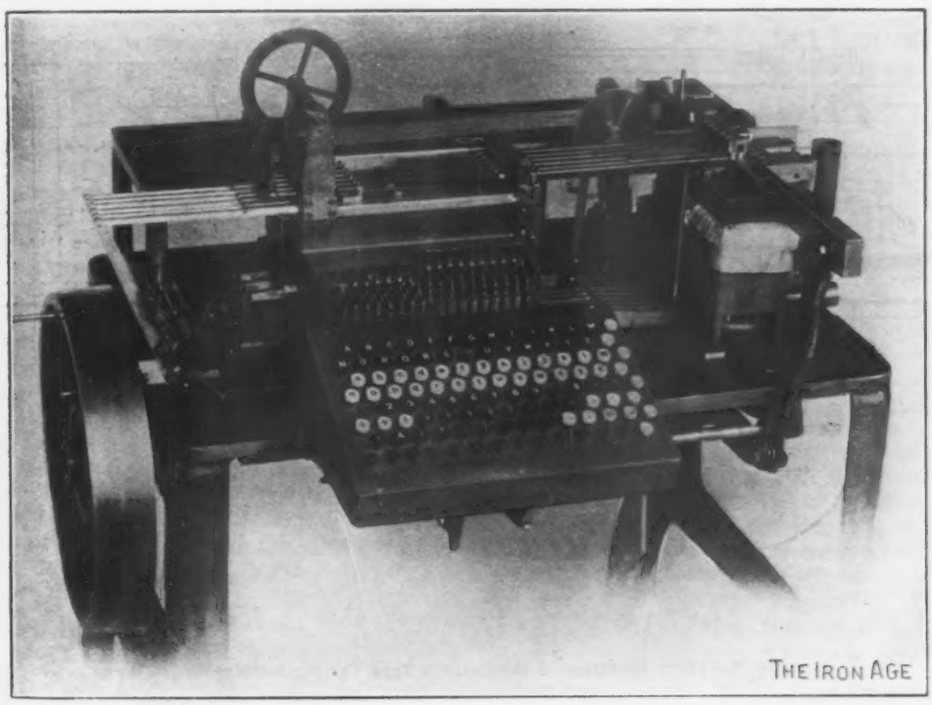


Fig. 1.—The First Model of the Pearson Type Casting Machine.

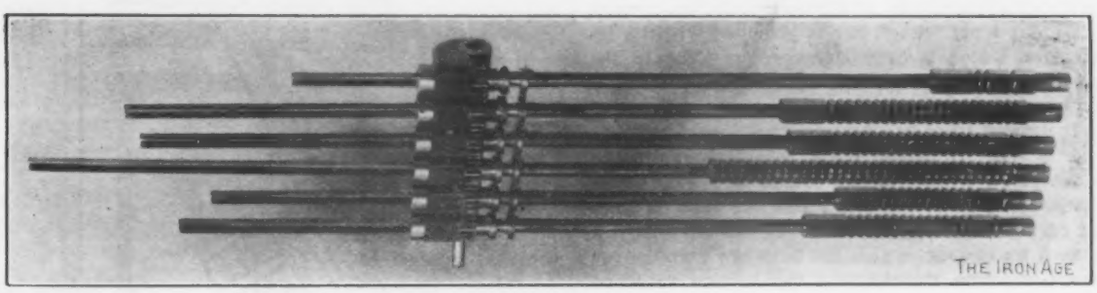


Fig. 2.—The Four-Font, 400-Character Magazine.

Fig. 1 is a view of this machine. Its distinguishing feature is the matrix magazine, which carries four fonts of 100 characters each, any one of which may be brought instantly into operative position. But the new machine is not limited to four fonts. It may be designed to carry five, six, seven and even eight fonts, provided that corresponding characters in each font have the same body thickness. When it is desired to cast type of a different body thickness the change of magazine and molds can be effected in less than a minute and a half, and it is possible to further simplify the mechanism to such an extent that the change can be made in a much shorter period of time. The machine is still in a crude state, as viewed from a mechanical standpoint, and is capable of much improvement. In its finished state it will probably be only little larger than a sewing machine. Even in its present condition the machine has shown clearly that it is capable of successfully doing the work of the advertising room at a speed favorably comparable with that of existing machines on straight matter.

The new machine casts single character types, which facilitate corrections of the type matter. This is particularly important in book work, which usually requires many alterations, and in composing advertising matter, which owing to its irregular nature is likely to contain frequent errors. It is claimed to be the first casting and composing machine in which a type is cast every time a

key is touched. Other machines which cast and compose single character types consist of two parts, one of which perforates a paper ribbon with different combinations for the various characters and with a combination at the end of each line for the required thickness of the spaces necessary to justify that line. The second machine then casts the type under control of the perforated ribbon. In the Pearson invention all operations are performed on a single machine, thus dispensing with the services of a second operative.

Fig. 2 shows the complete four-font, 400-character magazine. It comprises six bars, which are arranged to

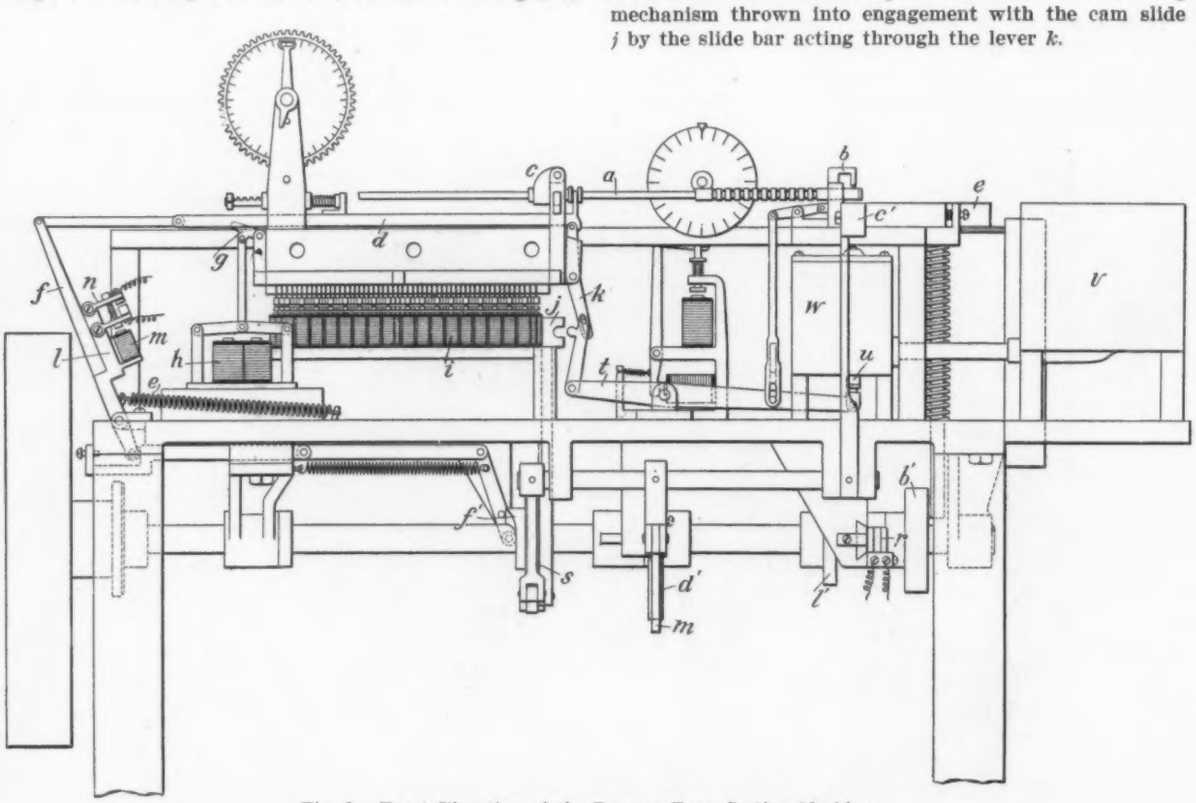


Fig. 3.—Front Elevation of the Pearson Type Casting Machine.

respectively carry matrices of from 2 to 7 units thickness. Each bar is of square section and its four faces respectively carry matrices of corresponding characters, but of different fonts. Each bar is provided with its individual mold, which is of a size corresponding to the thickness of the matrices on that bar. The matrices are arranged in a single column on each face of the bar, and when it is desired to cast a certain type the proper bar is moved across its mold, until the desired matrix reaches the mold, when the bar comes to a stop. The bar is then clamped to the mold and the type is cast. Each bar carries a pinion and these pinions all engage a common rack by moving which the bars are turned over simultaneously. The matrices on the bottom faces of the bars are in operative position, and to use matrices of a different font it is merely necessary to move the rack until the desired font is in operative position.

The type as soon as it is cast is moved into a chamber of the "word magazine." In this chamber all the types of a word are assembled, after which the magazine moves forward to present a new chamber to the mold, in which the types of the second word are assembled. No spaces are cast until after all the words of the line have been cast. Then the proper space key, as called for by a counter on the machine, is struck once for each space required, casting the necessary spaces to completely fill out or justify the line. As the spaces are cast they are moved successively into the galley carrying with them the words in the word magazine. A special line key moves the last word of the line into the galley, where the entire line is thus assembled and justified.

In the accompanying drawing, Fig. 3, one of the matrix bars is indicated at *a*. It is supported at the mold in a guide piece, *b*, and the opposite end is splined to a sleeve carried by the hanger *c*. A slide bar, *d*, is formed with a yoke which fits between two collars on the matrix bar. A spring, *e*, acting on the lever *b* causes the matrix bar to move over its mold, when the detent *g* is drawn down by the electromagnet *h*. At the same time one of the magnets, *i*, lifts a stop pin in the path of a lug on the slide bar to arrest the matrix bar when the desired matrix reaches the mold. This construction is repeated for each matrix bar, and when a key of the keyboard is struck the proper magnets, *h* and *i*, are energized to release the desired bar and arrest it over the mold. Each matrix bar is provided with its own casting mechanism thrown into engagement with the cam slide *j* by the slide bar acting through the lever *k*.

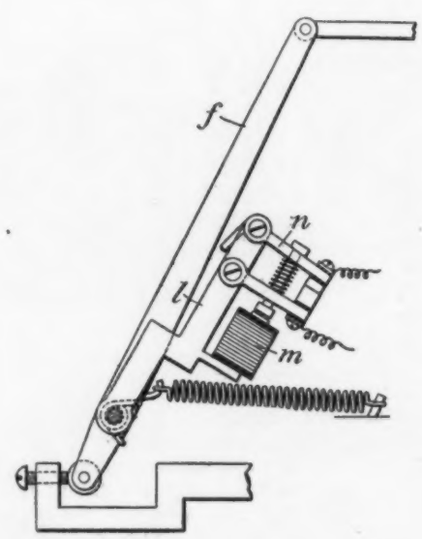


Fig. 4.—Detail of Circuit Closer Controlling the Clutch.

The cam shaft is set in motion by a friction clutch on the driving pulley. To delay the action of this clutch until the proper matrix has reached the mold the following mechanism is employed: A swinging frame, *l*, is held against the levers *f* by a spring, so that when any one of the matrix bars moves forward the frame is also swung forward by the corresponding lever. An electro-

magnet, *m*, carried on this frame is energized every time a key of the keyboard is depressed, but is unable to attract its armature, as the latter is attached to a lever, *n*, which carries a plate that rests against the levers *f*. But the abrupt stopping of the matrix bar throws the frame *l* clear of the levers *f*, as shown in Fig. 4, releasing the armature, which thereupon closes the circuit of the magnet *o*, Fig. 5. The latter withdraws the stop bar *p* from engagement with a notch in the cam *q*, and also makes a contact at *r*, which operates the friction clutch. The circuit of the clutch is kept closed by the cam *q* until it has made a complete turn, when the stop bar springs back into the notch, breaking contact at *r* and bringing the cam shaft to a stop.

The casting mechanism is operated by a cam, *s*, Fig. 3, which draws down the slide *j*, rocking the lever *t*, and thus actuating the guide *b* and the injector *u*. The molten metal is kept in a reservoir, v, whence it is fed to chamber *w*. The chamber and one of the molds is shown in Fig. 6. The hollow injector stem passes through a guide, *x*, formed in the chamber. A recess is provided at the bottom of the guide and as the injector is raised to the mold a sleeve, *u*, threaded on the injector stem enters this recess, forcing the type metal through the hollow stem into the mold. At the same time the guide piece *b* clamps the matrix bar to the mold and by engaging a groove, *z*, adjusts the matrix to proper position. As soon as the type is cast the block *a'* is moved to cut and smooth off the bottom and the sides of the mold are withdrawn by the cam *b'*, Fig. 5, leaving an open channel through the mold block. An ejector, *c'*, is now operated by cam *d'*, Fig. 3, to push the type out of the channel into a chamber of the word magazine *e'*, and the matrix bar is returned to normal position by the cam *f'*.

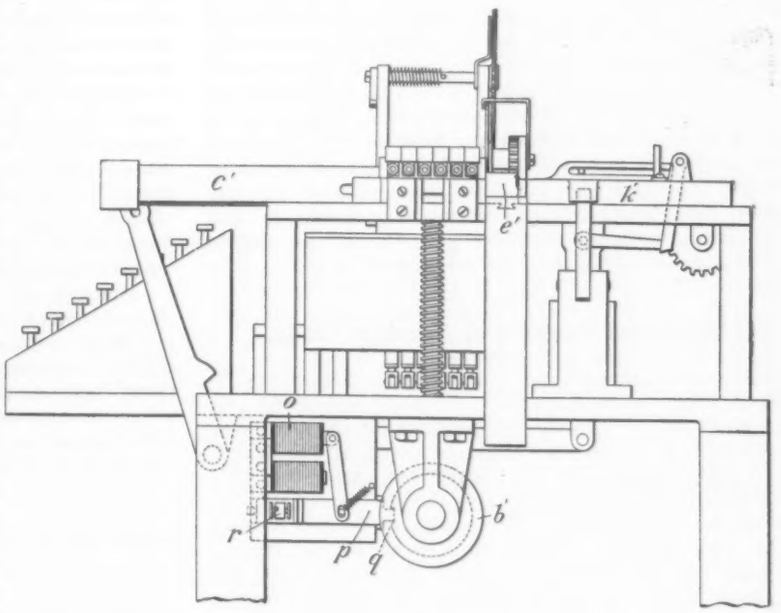


Fig. 5.—End Elevation of the Machine.

At each touch of a key a type is thus cast until a complete word is assembled in the magazine, then a word key is depressed which shifts the magazine to present a new chamber to the mold channel. The word magazine is formed on the bottom with ratchet teeth, which are engaged by a pawl, *g'*, Fig. 7, mounted on the armature of the magnet *h'*. When the word key is depressed this magnet is energized and the magazine is thus shifted. A detent, *i'*, prevents the magazine from being drawn back by a counterweight attached to it. When all the words of a line have been assembled in the magazine a key is touched which energizes the magnet *j'*. This draws down the detent *i'* and with it the pawl *g'*, permitting the magazine to slide back to its original position with the first word opposite the mold. The throw of the ejector is now increased by operating the eccentric *m'*, Fig. 3, to move the cam lever into closer engagement with its cam *d'*, so that when the space key is touched and a space is cast it is ejected through the word magazine into the galley, pushing the word before it. The magazine is then moved forward to bring the next word in the path of the second key and thus the operation continues until the last word is moved into the galley without a space by touching a key, which closes the circuit of the magnet *o*, Fig. 5, without releasing any of the matrix bars. The entire line is thus assembled and completely justified, and as the last word is moved into the galley the block *k'*

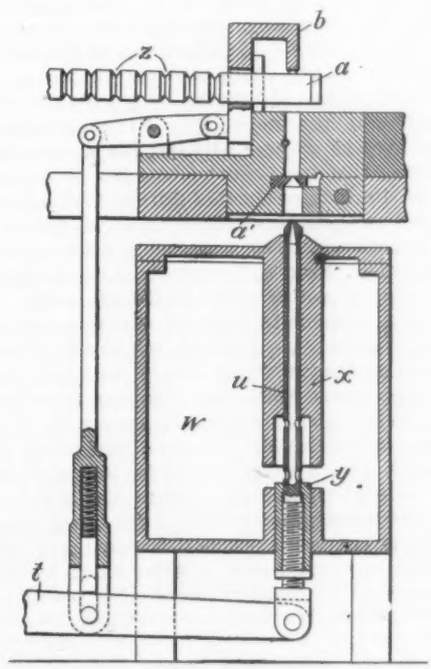


Fig. 6.—Section through the Casting Mechanism.

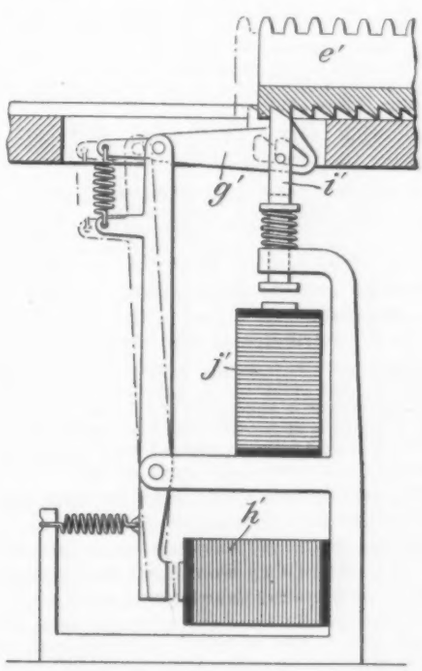


Fig. 7.—Detail of Magnets Operating the Word Magazine.

is actuated by cam *l'*, Fig. 3, to move the assembled type out of the path of the next line.

The machine acts at a speed which seems incredible to any one not familiar with type casting machines, and no adequate conception of this speed can be obtained from the detailed description given above. The operation of casting the spaces and justifying the lines is done mechanically, while the operator is looking over his copy for the next line. Operators on other machines are in the habit of pausing at the end of each line to glance over their copy and the inventors have taken advantage of this fact to greatly simplify the machine. While it was the purpose of the inventors to design a machine which would operate at the moderate speed of 3500 ems per hour, there seems to be no reason why speeds of 4500 ems cannot be obtained in view of the rapid operation of certain type casting machines heretofore built.

Mexican Finance and Foreign Trade.

DURANGO, January 6, 1906.—Minister Limantour recently submitted to Congress a statement embodying estimates of the revenue and expenditures for the fiscal year 1906-1907, in which the former is placed at $90,073,500, and asking approval for appropriations aggregating $89,897,397.64. In submitting this budget statement the Minister observes that "the estimate of normal revenue shows a difference of $1,969,500 in excess of the estimate which was formulated . . . of the revenue for the current fiscal year, and a difference of $2,010,386.66 less than the revenue actually collected in the first fiscal year," the upward tendency of the revenue being noteworthy from the fact that the reduction of mining taxes involves a loss in revenue to the Government aggregating $4,000,000 annually. Commenting upon the effect of the change in the monetary system Señor Limantour says:

> It is a source of profound gratification to the Executive that during the year since publicity was given to the monetary plan the changed conditions should not have been accompanied by any material hardship to the numerous producing classes of the Republic, and still less to the consuming classes. The minor inconveniences which the change of system occasioned were susceptible of being easily redressed by measures . . . such as the revision of the tariff of import duties and the granting of franchises to the mining industry, which quickly restored equilibrium to the interests chiefly affected.

The following figures of imports, gold values, are given, showing the increase in the last fiscal year:

Fiscal years.	Free goods.	Dutiable goods.	Total imports.
1903-04.....	$15,420,693.66	$62,940,077.40	$78,360,771.06
1904-05.....	16,023,481.56	70,098,812.10	86,122,293.66
Increase....	$602,787.90	$7,158,734.70	$7,761,522.60

The Minister regards this marked increase in the imports with satisfaction, believing that the new monetary laws have contributed to the result. He remarks:

> The increase in the importation of dutiable goods was more than 11 per cent., and probably the monetary reform influenced that increase by causing a sudden decline in the rate of foreign exchange in the months of November and December of last year, a decline which undoubtedly encouraged many merchants and private persons to place orders for goods abroad.

Following an exhaustive review of the country's trade with other nations and of foreign investments of capital, Señor Limantour asks and answers the important question: "To what extent may we congratulate ourselves on this condition of our economical relations?"

> Whatever may be said as to the drawbacks of a situation which renders us tributary to foreign countries, and, what is more, tends to increase the volume of payments that have to be made abroad, there can be no doubt that, lacking as we do both the men and the money necessary for the full development of the manifold resources of our soil, we are not in a position to reject those elements when offered to us simply because they come from other lands.

No Free Importation of Iron and Steel.

The Diaz administration is not in the habit of hastily formulating a policy and of revising it at a later day to meet the seeming exigencies of the moment. The report, therefore, which was published in *The Iron Age* for December 7, that it is the intention of the Government to assume a new attitude in relation to imports of iron and steel and their manufactures and to admit such products at greatly reduced rates of duty, if not to place them entirely upon the free list, seemed to indicate an altogether unreasonable course to one familiar with the trend of Government policy in relation to domestic industries and the needs of the Exchequer. In view of the importance of the subject both to United States exporters and to the domestic iron and steel strade, the writer addressed a letter to Señor Limantour, the Secretary of the Treasury, in order to learn the truth of the matter.

Minister Limantour, through his private secretary, Señor Vicente Luengas, under date of December 27, replied as follows: "By the direction of the Minister I answer your esteemed letter of the 22d inst., and make known to you that the report referred to that it is intended shortly to pass a law authorizing the free importation of iron and steel and their manufactures is without foundation (*carece de exactitud.*)"

Although this denial refers specifically to the "free importation of iron and steel and their manufactures" and says nothing in regard to a proposed "large reduction" of duties upon such products, seeing that the tariff upon these manufactures was greatly increased within the past year, it is a reasonable inference from the Minister's letter that there is no intention at this time of changing the tariff schedule in this respect. J. J. D.

Proposed Consolidation in the British Steel Trade.

Efforts have been made recently to bring together the Ebbw Vale Steel, Iron & Coal Company, Limited, of Ebbw Vale, Monmouthshire, England, and the important iron and steel consolidation, Guest, Keen & Nettlefolds, Limited. A circular has been issued to the shareholders of both companies by a London promoter setting forth the advantages that would result from a combination of interests. Guest, Keen & Nettlefolds, Limited, has the following capitalization: 4 per cent. debentures, £1,850,000; 344,000 preference shares of £5 each, £1,720,000; 965,000 ordinary shares of £1 each, £965,000; total, £4,535,500. The capitalization of the Ebbw Vale Company, Limited, is as follows: 5 per cent. debentures, £438,100; 74,475 shares of £13 each (£10 paid), £744,750; £3 per share paid on 4721 of the above shares, £14,163; total, £1,197,013. It is stated in the announcement that the Ebbw Vale Steel Company has earned an average of over £105,000 per annum for the last 13 years; that its output of coal has been 1,500,000 tons a year, its coke production 260,000 tons a year, its pig iron and steel outputs 220,000 tons and 156,000 tons per year respectively. The projected new furnaces to be erected by Guest, Keen & Nettlefolds, Limited, at Dowlais, Wales, at a cost of about £1,250,000 would not be necessary if a consolidation took place, it is stated, as the newly erected Ebbw Vale furnaces, which are of modern capacity and equipment, would supply the want. Among the advantages to the Ebbw Vale Company from the consolidation are mentioned a constant supply of ore from Guest, Keen & Nettlefolds' Orconera iron mines in the north of Spain, also a ready market for its output, owing to the established trade of the Patent Nut & Bolt Company and Nettlefolds, constituents of the latter company. On the basis of last year's profits it is stated that the consolidated company would earn £494,839, which would represent 20 per cent. on ordinary shares after providing for debenture interest and preference dividends.

The A. I. E. E. Building Fund.—The General Electric Company, in view of the great importance and utility of the United Engineering Building, New York, as a home and center for the engineering professions and arts, has made a contribution of $25,000 to the land and building fund of the American Institute of Electrical Engineers. President C. A. Coffin, who takes a warm personal interest in the matter, has also sent his own check for $5000. The fund is now well over $100,000 and with renewed energy the committee having this matter in charge has begun its canvass of the field with the object of securing the second necessary $100,000.

The Sheet and Tin Plate Trade.

BY B. E. V. LUTY, PITTSBURGH.

A year ago, in a review of the sheet and tin plate industries of the United States, comment was made on the rapid increase in production, the two industries then having reached an annual tonnage of about 1,000,000 gross tons. If the previous increase was worthy of remark, the increase since that review was written has been well-nigh phenomenal, since the leading interest alone has in the year 1905 made more than 1,000,000 gross tons, having shipped about 1,050,000 gross tons during the year, and would have produced close to 1,100,000 gross tons had the supply of steel been adequate in the closing months of the year.

No less remarkable from a review point has been the fact that with generally prosperous conditions in the iron trade and the general level of prices materially higher than that which prevailed in 1904 prices of sheets and tin plates have not been higher than in 1904, but have been a trifle lower. This fact is remarkable when taken by itself, but a study of it in connection with certain other considerations tends to allay the surprise which would otherwise be felt. Certainly if the problem were set down in the bare form that demand and production in a particular line have increased amazingly, that demand and production in other lines have increased to a comparatively much less extent and that the prices of these other lines have shown a marked increase the answer would naturally be that prices in the line which has grown so rapidly should if they had been relatively low have shown a very material advance. There is a great deal more to the problem than is contained in this statement of it.

The Course of Prices.

Sheets opened the year at 2.30 cents per pound, Pittsburgh, for No. 28 gauge, galvanized being 1.05 cents over black. In February and March advances of $2 a ton in the official prices were made, but the new official prices were held but a short time and the subsequent decline carried prices down straight past the previous official prices. In the fall a slight recovery brought prices up to the basis of 2.20 cents for black and 3.25 cents for galvanized. On November 20 an official advance of $2 a ton was made, to 2.30 and 3.35 cents respectively.

In tin plate the official prices have by no means been representative at all times of either the current value of shipments or of the current market price. On November 15, 1904, an advance from $3.30 to $3.45 per box had been made and on December 22 an advance to $3.55, these prices being official and subject to the regular 5-cent rebate. Most of the large business for the first half had been done at $3.25 net. As contracts expired they were replaced by new ones at $3.50 net, but the market became weak and specifications poor, the conditions crystallizing into an offer by the leading interest dated August 5, good for 60 days, giving a special rebate of 15 cents to induce specifying, making the net price $3.35. On October 2 a new official price of $3.30, or $3.25 net, was made. On November 20 the official price was advanced to $3.40.

Comparison of Prices.

Making a very crude estimate it may be said that the average price at which the 1905 tonnage was sold was about 2.20 cents for sheets and $3.30 for tin plate. The realized values in 1904 were practically the same as these. A comparison with 1903 is less easily made, since during that year sheet and tin plate prices moved quite independently of each other, sheets ruling steadily at 2.70 cents during the first half and declining to 2.35 cents during the second half, whereas tin plate opened and closed at $3.55 net, while an advance of 20 cents was actually effective on shipments during the first four months or so of the second half.

Despite the brevity of this presentation of sheet and tin plate prices, it is sufficient to show the departure from the course of other iron and steel prices. Pig iron, crude steel, plates, merchant bars, shapes, &c., were all considerably lower in 1904 than in 1905, while sheets and tin plates brought about the same prices in the two years. The year 1903 closed with sheets at 2.35 cents, tin plate at $3.55 net, Bessemer pig iron at $14.10, Pittsburgh, and billets at $23. Comparing with these prices the closing prices of 1905 there is seen to be a decline of $1 a ton in sheets, with contracts in force at a $3 decline, a decline of 20 cents a box in tin plate, with contracts in force at 30 cents decline and advances of $4.25 in Bessemer pig iron and $3 in billets. Comparisons of this sort could be prolonged indefinitely, but only one other will be instanced. Early in 1898 the Association of Iron and Steel Sheet Manufacturers prepared a diagram to illustrate how the spread had been decreasing between pig iron and crude steel on the one hand and black and galvanized sheets on the other. The diagram covered the five years 1893 to 1898. It showed a spread between gross tons of billets and net tons of No. 28 gauge sheets declining from $37 at the start to $27 at the close, once touching a minimum of $25, and making an average during the five years of $33. At the close of 1905 the spread was only $20, taking the open market price on billets. Having regard for the fact that the most favorable steel contracts are at somewhat less than the current market price, the spread was still less than $20, before the $2 advance in sheets was made on November 20. Present prices of steel being much higher than in the period from 1893 to 1897 the spread should be greater, other things being equal.

More than enough of bare figures has been brought forth to show that relative to raw materials there has been a very great decline in sheets and tin plates. There is no reason to suppose that anything like the former spreads will ever be restored.

The Number of Mills.

A year ago this review gave the leading interest's operative capacity in sheets as 163 mills, including two light plate mills and several jobbing mills. The mill at Sharon was not included. It had been almost completed as a sheet mill by its former owner, the Sharon Sheet Steel Company, which had been absorbed by the Union-Sharon purchase and was being transformed into a Bray semi-continuous mill. During the year this mill was completed in its new form and is now listed as a 10-mill plant. The American Sheet & Tin Plate Company has also, during the year, added one sheet mill at the Wood works, McKeesport, at the Hyde Park works and at the Leechburg works, so that it now has 176 sheet mills, against 163 sheet mills a year ago.

There have been no changes in the tin mills of the American Sheet & Tin Plate Company, other than the purchase of the six-mill plant at Morgantown, W. Va. This is being completed and enlarged to a 10-mill plant. It is known as the Sabraton, and when completed, early in 1906, will increase the number of the company's tin mills to 252.

There has been little change among the independents. A very few sheet mills have been added. At the close of 1904 there were incomplete or inoperative tin plate plants at the following points: Pueblo, Col.; Morgantown, W. Va.; Marietta, Ohio; Clarksburg, W. Va.; Greencastle, Ind., and Atlanta, Ind. As stated, the Morgantown plant has been taken over by the leading interest. The Clarksburg plant was sold to the Phillips Sheet & Tin Plate Company, and is in operation. The Greencastle plant was taken over by the Berger interests of Canton, Ohio, and has been put in operation.

Relations with Labor.

One of the most important changes which has ever been made with respect to wage matters in sheet and tin plate mills was accomplished on the night of July 3, 1905, when the Amalgamated Association of Iron, Steel and Tin Workers agreed, in conference with the American Sheet & Tin Plate Company, to abolish entirely all limits

of output. The concession was one which the manufacturers had earnestly desired for many years and had eagerly sought for at every conference where conditions were such as to promise the least hope of success. The demand had on several occasions been met by a small concession. Many years ago the limit in sheet mills was increased from seven to nine heats per turn, while on January 1, 1904, an increase to ten went into effect. In 1899 the limit on the tin plate scale was increased 500 pounds per turn on all gauges, and in 1902 there was an increase of 500 pounds on gauges 31 and heavier, and of 300 pounds on lighter gauges.

The Amalgamated Association wage settlement, at which this most important concession was made, had been preceded by more indefensible claims than had perhaps ever been the case before. The manufacturers, on the other hand, were better prepared than ever before to enforce the settlement which they desired and which they believed fair. The American Sheet & Tin Plate Company had made somewhat the same preparations for a contest which it had made in the previous year by accumulating stocks, with the difference that the contest, if any, was to commence at the expiration of the scale year, June 30, instead of three months earlier, as in 1904. The Dresden, Canton and New Kensington mills were taken from the union ranks, and some concessions were made through the elimination of extras on certain wide sheets and tin plates.

Production.

The shipments of the American Sheet & Tin Plate Company during 1905 were approximately 1,050,000 gross tons of sheet and tin mill products. The production cannot be accurately stated at this time, but from the reduction of stocks during the year it can be estimated that production was in the neighborhood of an even million gross tons, divided roughly into 450,000 gross tons of tin mill products and 550,000 gross tons of sheet mill products, the tin mill product including enameling and other special sheets which were not actually tin or terne coated.

The production of the American Sheet & Tin Plate Company and of the two companies to which it succeeded has been as follows, the figures being reduced to gross tons:

	Gross tons.
1902	699,621
1903	763,670
1904	735,482
1905	1,000,000

There never have been statistics of the country's production of sheets, and even were there such statistics it would be extremely difficult, on account of the large increase, to make anything like a close estimate of the production in the year just closed. It can be said, as a very rough approximation, that the country's total production in 1905 has been not far from 600,000 gross tons of tin mill products and 800,000 gross tons of sheet mill products, a total of 1,400,000 gross tons, against approximately 1,000,000 gross tons in 1904, although that year's production had shown a heavy increase over previous years. The tin mill production includes a certain proportion of material which was rolled tin mill style and finished as black plates for tinning are finished, but was used for enameling stock, &c. The great bulk, however, was actually tinned.

For years the potential capacity of the country in both sheets and tin plates has been materially in excess of demand or production. Nevertheless, it would not have been possible for the mills which were in actual operation during the year to have made the tonnage with which they are credited if the limit of output as formerly prescribed had been lived up to in those mills operated under the union. The fact is that prior to the formal abrogation of the limit at the middle of the year, it had been generally if not universally violated. The present potential capacity of the mills is materially in excess of the tonnage which was actually produced in 1905, as the mills were not all operated continuously. In tin plates there was almost full operation of the leading interest's mills during the first half, there being many weeks during which the full 242 tin mills were operated. About the beginning of June this interest started closing tin mills, and before the end of the month had about one-third of them idle. During July it had in operation scarcely a third, and not until the fourth quarter were as many as two-thirds in operation. The starting of additional mills during the fourth quarter was impeded by the difficulty in obtaining steel. Had steel been plentiful, practically all the mills would have been operated during the second half of the quarter. The operations of the independent tin plate mills were spread more evenly over the year. The production of tin plate by the leading interest was much heavier in the first half than in the second, large stocks being on hand July 1. In sheets its production was more evenly balanced between the two halves.

The Competition.

Our review now reaches a point where we can properly take up the subject which has most engrossed the minds of producers during the past year—the sharp competition. While in plates, rails, shapes, merchant steel bars and some other important lines of steel production competition has been quite lacking, so far as prices go, it has been very keen indeed in sheets and tin plates. The difference is a striking one. In these other lines there has not been so great an increase in demand as there has been in sheets and tin plates and it would naturally be supposed that the large increase would have tended to mitigate the stress of competition and bring about some kind of an approximation to the smoothness with which business has been conducted in other lines. Quite the reverse has been the case. Not only has competition been keen, but it has, particularly in tin plates, been attended by some ill feeling.

In one sense it could be said that competition has been keen among the independents, but that has been not so much from the existence of a spirit of competition as because by reason of the leading interest taking good care of its customers and holding them closely the field of competition among independents has been somewhat restricted. A given buyer being outside the fold the question would be which independent would secure him. A large part of the buying trade is impossible to the independents. It has been between the independents as a class and the leading interest that the spirit of competition has been most keen. Charges and counter charges of cutting have been made. The independents have charged the leading interest with being unduly sensitive, for so large a corporation, to the loss of single customers and to the cutting of independents upon minor orders, such as those where a limited quantity of cut-downs was involved. Some personalities have even been indulged in and in some quarters the conclusion has been nursed that all was not harmony in the ranks of the leading interest, and it has been held that with conditions of demand as they have been the United States Steel Corporation could have made more money, even though by pursuing a somewhat different policy its total tonnage might have been slightly reduced. The leading interest, on the other hand, appears to have regarded the selling policy of the independents as not always of the best.

As is very frequent in differences of opinion, the difficulty appears to have been due to the parties reasoning from premises which were different, when in the logic of the cases the right premises were necessarily the same. The independents have, for instance, been prone to base their arguments upon the market prices for billets or sheet bars, when in reality the United States Steel Corporation is an organization effected for the purpose of converting coking coal, ore and limestone into marketable product. The current market price for billets and sheet bars is simply an incident. There are large profits between the minerals and the semifinished steel. Then, too, there may be some misapprehension as to how much it costs the leading interests to convert the semifinished product into finished product. The cost may be somewhat less than is generally supposed.

On the other side there has, perhaps, been too little effort made to realize the exigencies under which a relatively small business undertaking must be operated. Stocks of odd sizes must be disposed of and cannot be held for the opportunities of disposal which naturally arise in the conduct of a very large business, with many buyers of quite varied requirements. On both sides

there has been a disposition to assume that the competition was to be conducted according to certain pre-arranged rules, as is a game of chess. Modern business, on the contrary, consists largely in the player endeavoring to formulate and follow a new rule without his opponent's knowledge.

Exports and Rebate Tin Plate.

Exports of tin plate were negligible in 1903, being but 292 gross tons. In 1904 they were 7898 gross tons and in 1905 they were substantially as large. These exports are of tin plate in that form and must not be confused with what are known in the vernacular as "rebate plates," these being plates, whether of foreign or domestic origin, which form cans or cases for oil, meat, fruit, fish, &c., which are exported. A limited quantity of "rebate plate" enters into the construction of exported carpet sweepers and forms a lining for various cases which are exported. If the material is foreign plate the government rebates 99 per cent. of the duty originally paid. If it is domestic the American Sheet & Tin Plate Company makes a rebate, at the time of the exportation, of a sum sufficient to make the material competitive with imported plate. In doing this it is aided to an extent by a concession which the Amalgamated Association makes, the form being that 3 per cent. of all tin plate wages is placed in a fund from which withdrawals are made as rebates are paid, the withdrawal in each case being 25 per cent. of the wages originally paid in the manufacture of the tin plate which enters into, or, to be a trifle more exact, surrounds, the exported article. This arrangement with the workmen was first made in the fall of 1902. In the summer of 1904 the retention was cut in half, the rebate being made the same, so that the fund provided for a rebate on only half as large a quantity as under the original arrangements. In the summer of 1905 the original retention of 3 per cent. was restored. Even approximate figures have never been obtainable from authoritative sources as to the tonnage of rebate business done in domestic plates, but it is well understood that the tonnage is large, much larger than the exports of tin plate in the form of tin plate.

The Bray Mill.

The Bray semicontinuous mill at the Monongahela Tin Plate Works has been in operation during 1905. The mill of quite similar pattern, but for the rolling of sheets, at the Sharon plant, was completed about the beginning of the fourth quarter, and has since been operated. The Monongahela mill has an output of about 100 gross tons per day. The Sharon mill will have an output of about 150 tons per day. This tonnage has already been exceeded on a number of occasions, but the full results expected have not yet been attained, on account of the time necessary to drill men to an entirely new system of operation. The machinery itself is performing its functions very satisfactorily. Gauge 22 and heavier are shipped without finishing by hand; the lighter gauges require some finishing passes by hand. At the Monongahela works, the product going into tin plate, the gauges are lighter, and all the product necessarily passes through a finishing operation.

The Carpenter Foundry Company's Dinner.—The fourth annual dinner given by the A. Carpenter & Sons Foundry Company, Providence, R. I., to the heads of departments was held January 1 at the Narragansett Hotel in that city. Henry A. Carpenter, treasurer of the company, was the host of the occasion, and with the party was one guest, Louis F. Patterson, a former foreman, but now with the United Shoe Machinery Company, Beverly, Mass. The menu was a unique creation, each course from the "Fluor Spar Oyster" to the "Cupola Stacks" having some special significance to the foundryman. The following toasts were responded to: "How to Save Money," Henry A. Carpenter; "The Ladies" (in the Core Room), George F. Whipple; "System," O. C. Barrows; "Advantages of Machines," W. D. Kent; "How We Got a Million in 25 Days," D. G. B. Allardice; "Be on Deck in the Morning," H. C. Arnold. A pleasant feature of the evening's entertainment was the presentation to Mr. Carpenter by Mr. Barrows in behalf of the foremen of a handsome floral piece in the design of a bull ladle.

Densitor Water Proofing for Concrete.

It is well known that Portland cement concrete is not water proof, and this is also true of most of the building stone now in common use. To overcome this objection numerous compounds have been placed on the market which are more or less satisfactory. Several of these are simply paraffin dissolved in gasoline and supplied as a wash or filler on the surface of the concrete. This affords temporary protection. Others use oils and fats combined with quick lime. These compounds are mixed dry with Portland cement in amounts of from 6 to 10 per cent. The Portland cement is then used in the ordinary way to form mortar with sand and gravel. These compounds produce mortars that will reject water for a time. The strength of the concrete or mortar is greatly reduced because the oil, tallow or paraffin decreases and often destroys the bonding or cementing properties of the cement, causing the concrete to crumble. None of the compounds will undergo the standard tests to which Portland cement is subjected to determine its soundness. Another water proofing wash or paint composed of barium hydrate (5 ounces dissolved in 1 gallon of water) applied as a wash on the surface of the concrete six or eight times at intervals of 48 hours does effective work. However, the time and labor required make this method expensive.

A new water proofing material in the form of a mineral wax is now being introduced under the name of Densitor by the Densitor Company, 228 La Salle street, Chicago, Ill. This material, ground and mixed with Portland cement in the proportion of 20 pounds of Densitor to each barrel of cement, produces what is known as Densitor cement. Concrete formed with this cement is sound, hard and dense, and is claimed to reject water as effectively as glass or marble. With extra care in selecting the aggregates, tamped concrete can be made as dense in appearance as marble or granite, and will take a polish equal to the best natural stone. Densitor water proofing absolutely prevents efflorescence by sealing the pores in exposed faces in concrete work. A mortar formed of 1 part of Densitor treated Portland cement to 3 parts of sand, when applied 1-16 inch thick as a finish on concrete work, produces a perfect water rejecting face.

Densitor is also used as a paint and applied with a brush. One pound of Densitor dissolved in water and mixed with from 4 to 5 pounds of Portland cement, will cover from 75 to 100 square feet of surface. With proper coloring matter and aggregates an artificial stone can be produced resembling jasper in finish and texture. Densitor cement will stand the boiling and freezing test to which Portland cement is submitted to prove its soundness, and gives practically the same analysis as Portland cement. It will pass all standard specifications for the latter, showing slightly higher tensile and compressive strength than high grade Portland cement alone.

The water resisting properties of Densitor cement are shown in the following test: Two blocks were prepared, one consisting of fine lake sand passing a 50-mesh screen, mixed with Portland cement in the proportion of 3 to 1. The other block was of the same mixture with Densitor cement substituted for the Portland. The first, after being immersed in water 24 hours, increased in weight 12.86 per cent. by the absorption of water and had not dried out thoroughly in air after 59 hours. It still retained 2.32 per cent. of water, and it took over an hour on a radiator to expel it. The other specimen left in water for the same length of time absorbed only 0.7 per cent. of its weight of water and dried within 45 minutes in the air.

The Chicago Drainage Board is using Densitor treated Portland cement in its new power house at Lockport, Ill. The concrete blocks used in the side walls and partitions are of the American Hydraulic Stone Company's two-piece pattern treated with a ¼-inch facing of Densitor mortar, making them water proof and uniform in color and texture. Ordinary cement building blocks vary greatly in both color and texture, and have the artificial appearance common to all concrete work, but when coated with Densitor this is removed and a clean, natural stone finish is presented.

The Development of High Duty Sawing and Slotting.

The use of modern high speed steel is in no operation shown to more advantage than in sawing and rotary slotting. The old way of sawing with a solid tempered steel saw blade and slotting with a single (occasionally a double) overhanging tool having a remittent movement is rapidly giving way in all cases of straight line cuts to the continuous cuts with high speed steel cutters, possible in the new sawing and slotting machines. Notably is this the case in such operations as the slitting and trimming of armor plate, cutting out of the throws of solid forged crank shafts, forming the open ends and forks of connecting rods and connecting rod straps, links and toggles, parting gear blanks and disks from bar stock, cutting steel blooms and ingots to lengths for forging and trimming ends of shafts and axles.

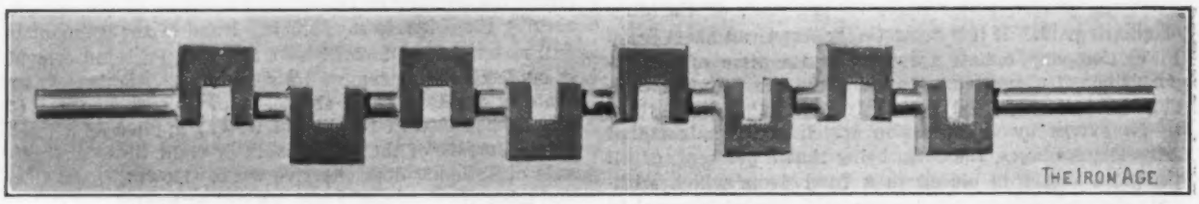


Fig. 1.—An Eight-Throw Crank Shaft Cut Out by the Machine Shown in Fig. 2.

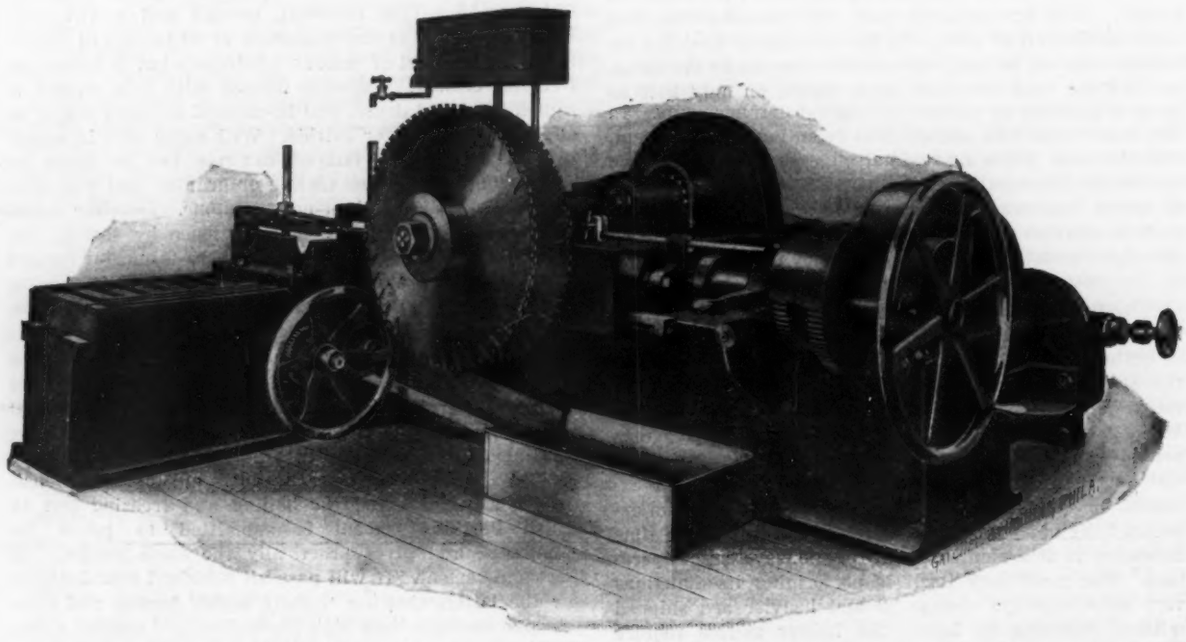


Fig. 2.—A 30-Inch Tindel Double Rotary Slotting Machine Built by the High Duty Saw & Tool Company, Eddystone, Pa.

A good example of rotary slotting is shown in the illustration, Fig. 1, of an eight-throw, rough machined crank shaft made at the forge works of the Tindel-Morris Company. The eight throws of this crank shaft were cut out by a 30-inch Tindel double rotary slotting machine made by the High Duty Saw & Tool Company, Eddystone, Pa. Sixteen slots were cut in this piece 8 inches deep and 6 inches thick in 1 hour and 44 minutes. An illustration of this machine is shown in Fig. 2.

Metal cutting at this speed is possible only by the use of machines designed with high power, supported by heavy and rigid construction and built in the best manner. The drive must be powerful, so that the cutters are forced into the kerf with a plowing cut and driven steadily through the work without chattering or vibration. The saw blade must be held rigidly up to its work. The saw arbor and its bearing should be of abundant strength and very well fitted. A glance at the machine, Fig. 2, will show a construction differing essentially from sawing machines hitherto in use. It will be seen that the carriage slides and frame work of the machine are cast in one solid piece. The carriage is of heavy design. The arbors are large in diameter, have large bearings and are bushed with hard phosphor bronze. The feed screws are large in diameter and of medium coarse pitch thread. No worm gearing is used, the power being transmitted through straight and bevel gears.

Another application of the Tindel system of high duty sawing to general shop work is shown in the illustration of a recent type of cut off machine, Figs. 3 and 4. Two leading features in this machine are noticeable—the application of the driving power direct to the saw blade and the use of the draw cut. A stiff gear is cut on the solid collar of the saw arbor against which the saw blade is bolted. A driving spur gear is meshed into it under the cut and on the same side. By means of this construction the driving power is exerted right at the cutting point instead of being transmitted through the arbor. Thus the compression of the saw blade—a fruitful source of buckling and breaking in the usual construction—is entirely avoided. The saw teeth are pulled through the cut instead of being pushed and a tensile strain only is put upon the blade.

Another original feature of this machine is shown in the carriage carrying the saw arbor and saw blade and the driving gear. It is of box section in place of the ordinary broad, flat saddle design, the construction admitting of much more strength and more compact form. The design of the carriage permits its being completely inclosed and supported in all directions in a rectangular housing. Every part of the driving mechanism is accessible and can be thoroughly lubricated. A single broad taper gib takes up all wear of carriage and slides. The machine is driven by an 18-inch pulley, 5½-inch double belt, running at 250 revolutions per minute, from which 38 reductions are made to the saw blade. As illustrating the compactness and power of this design, the machine shown weighs only 3000 pounds and drives a 30-inch Tindel high duty saw blade. The peripheral speed of the

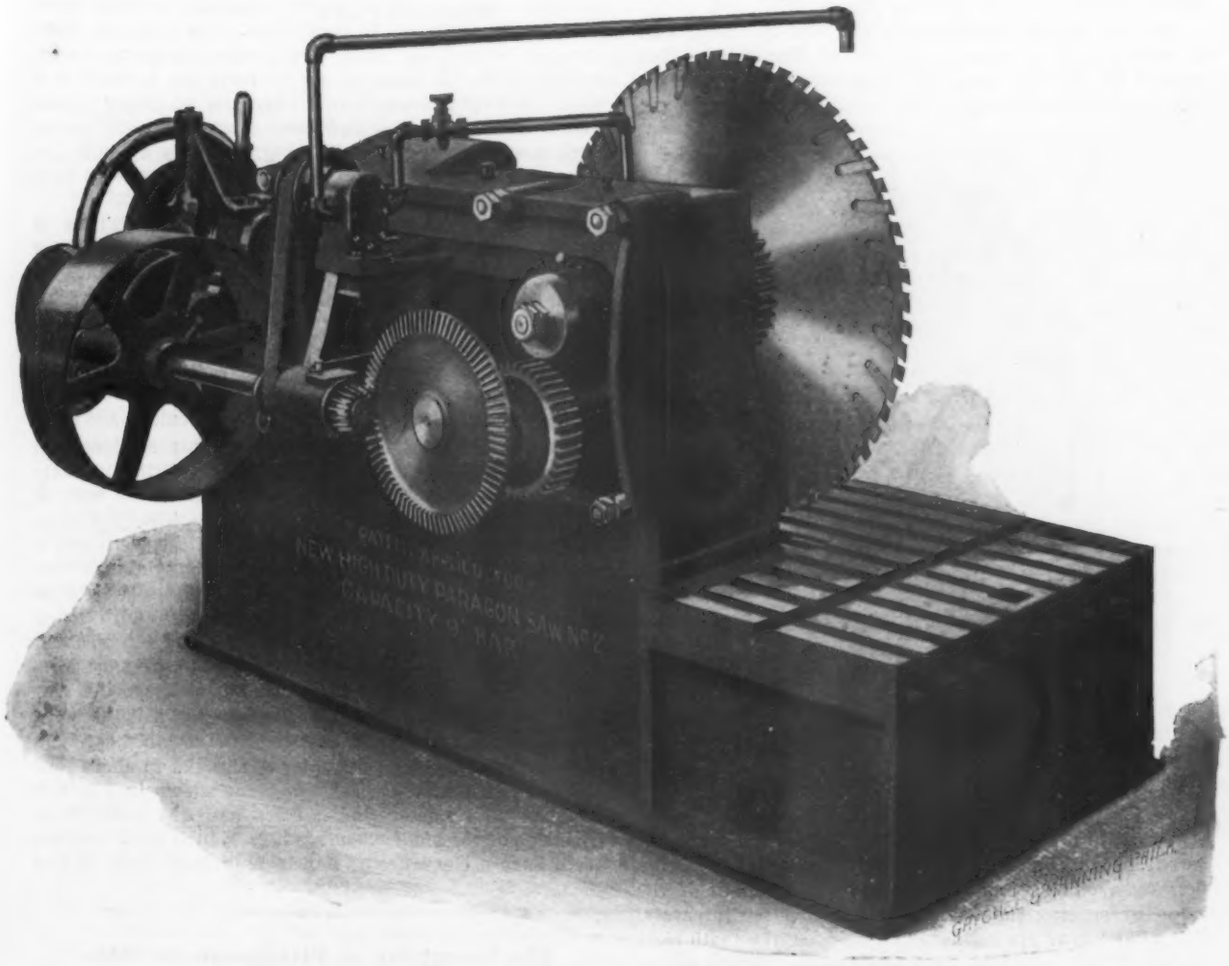


Fig. 3.—The New High Duty Paragon Saw with 30-Inch Blade.

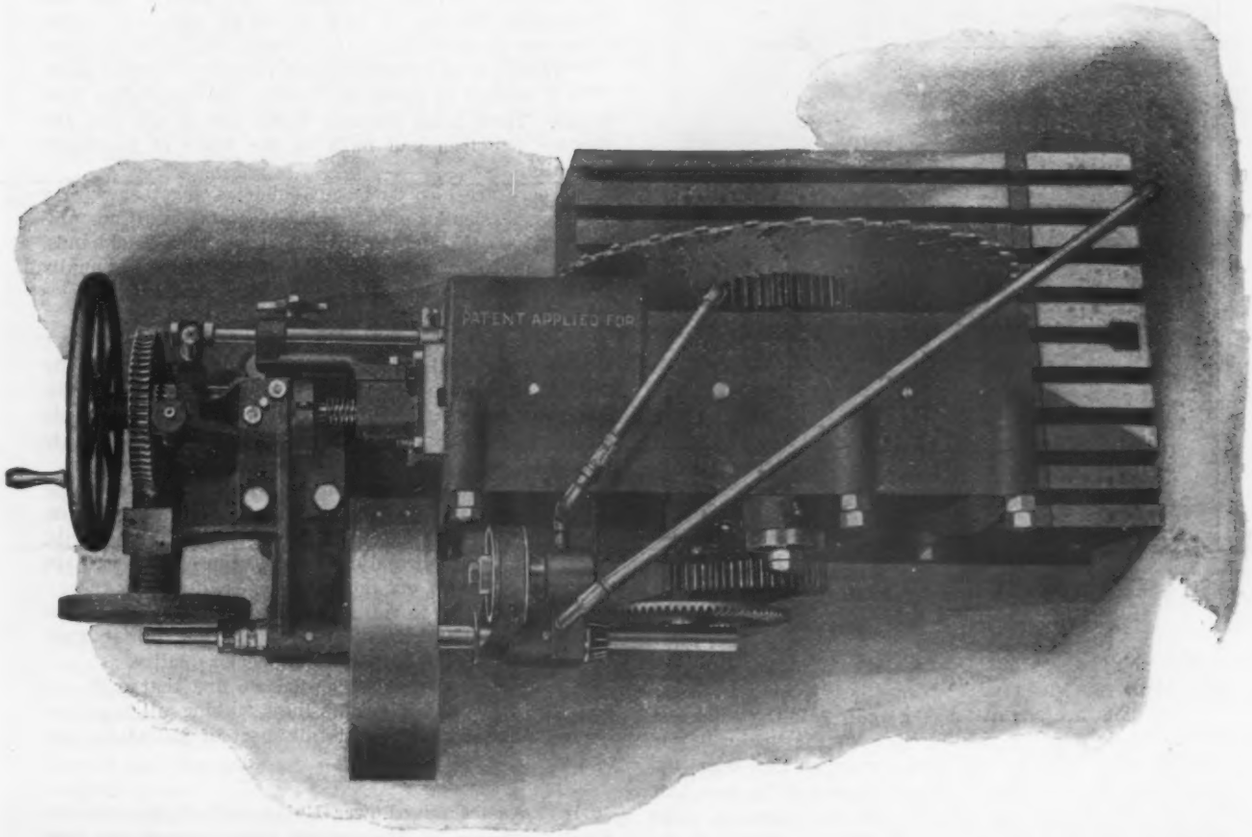


Fig. 4.—A Top View of the Same Tool.

saw blade is 50 feet per minute and the feeds can be varied from ½ inch to 1½ inches per minute.

The use of high speed steel is essential in this system of cutting, and the cutters must be of simple form that require no machine shaping; otherwise the saw blade becomes too costly, since quite a number of cutters are

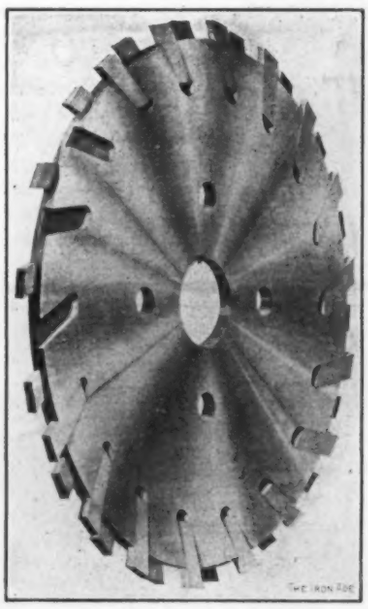


Fig. 5.—A Tindel Blade with Coarse Pitch Teeth for Heavy Work.

necessary in a blade—as many as can be spaced and inserted around the periphery of the saw without using too delicate a cutting tool or impairing the strength of the blade by spacing the teeth slots at too close intervals. The Tindel saws are solid and continuous, the tooth slots being cut half way into the blade and the cutters set on

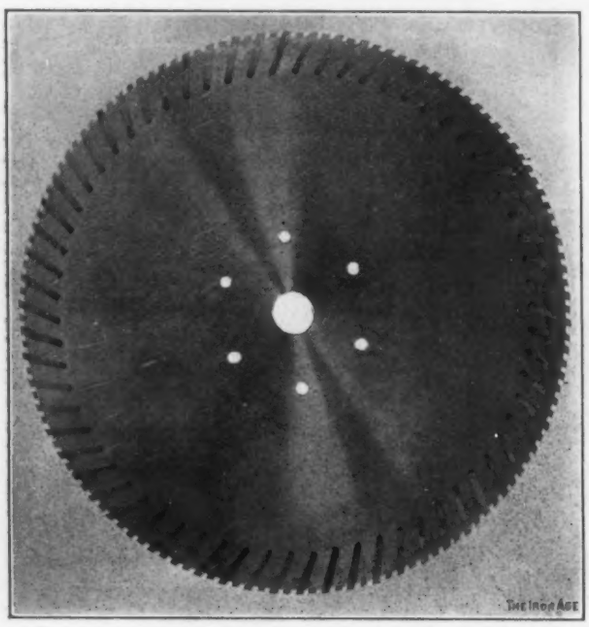


Fig. 6.—A Blade with More and Finer Teeth for Cutting Structural Shapes.

either side alternately. Thus the evil of dividing the saw blade into unsupported segments is avoided.

The slots are slightly deeper than half the thickness of the blade and the cutting edges of the teeth slightly overlap each other on the inner corner, so that when the saw teeth are imbedded each one takes a little over half the cut and makes clearance for the one following. The shape of the slots and their angle make it possible to insert the cutters with a driving fit. They keep in place without keepers, holders, wedges, brazing or any other fastening. It is possible, therefore, to make them of the simplest form, so simple that no expensive machine manipulation is necessary to form them. They are cut from straight beveled bar stock and dressed to shape on an emery wheel. A complete set of teeth for a blade is a short job with a blacksmith's forge and an emery wheel. Fig. 5 shows a Tindel high duty saw blade with coarse pitch teeth for heavy work. Fig. 6 shows a blade for structural shapes with more teeth of less pitch for thin sections.

Sawing structural material, whether angle, I or T beams, necessitates cutting alternately through a thick and thin section of material. In sawing a 12-inch I-beam, for instance, the shortest way through the material is through half the flanges, through the web and then through the other half of the flanges, the beam being set vertically on its flanges. Here the saw is required to cut first through sections about ½ inch thick, then one of 12 inches and again two of ½ inch. Two difficulties are met: the pounding of the saw teeth in the thin sections and the possibility of burning the teeth by friction in their longer passage through the thick section of the web, if the cutting speed is maintained the same. They are overcome in the first case by a short pitch of the teeth and a drive at a high rate of speed, giving each tooth but a very small bite on the material, and in the second case by a reduction of speed and a flooding of the kerf with soapy water. For cutting thin sections a pitch of teeth of about ¾ inch, Fig. 6, and a peripheral speed of 100 feet per minute is found to prevent pounding and make smooth cutting. A feed of 1½ inches per minute on average yard material on thin sections can then be obtained. As an illustration: A 6½-inch angle is cut through in about four and one-half minutes. The saw blade shown in Fig. 6 is 33 inches in diameter and is fitted with 132 teeth, 66 on each side of the blade. The blade is ⅜ inch thick and the teeth have a clearance of 1-16 inch, giving a kerf of 7-16 inch.

The Industries of Pittsburgh in 1850.

The remarkable industrial growth in Pittsburgh is aptly shown by a comparison between the industries in that city in 1850 and at present. An extract from the Pittsburgh directory of 1850, giving an inventory of the industrial plants operated the previous year, is as follows:

"There are in Pittsburgh and vicinity 13 rolling mills, with a capital of about $5,000,000 and employing 2500 hands. These mills consume 60,000 tons of pig iron and produce bar iron and nails to the value of $4,000,000 annually.

"There are also 30 large foundries, together with a great many smaller ones, having a capital in all amounting to $2,000,000 and employing not less than 2500 hands. These foundries consume 20,000 tons of pig metal annually and yield, with the labor employed, various articles amounting to $2,000,000.

"There are two establishments manufacturing locks, latches, coffee mills, patent scales, with a great variety of other malleable iron castings, with a capital of $250,000 and employing 500 hands, consuming 1200 tons of pig metal and producing goods to the amount of $300,000 annually.

"There are also a number of manufactories of the smaller sizes of iron, several manufactories of axes, hatchets, &c., spring steel and steel springs, axles, anvils, vises, mill, cross cut and other saws, gun barrels, shovels, spades, forks, hoes, cut tacks, brads, &c.

"There is also in full and successful operation an establishment manufacturing cast, shear and blister steel and files, all said to be of a very superior quality.

"After a careful investigation we find that with our manufacturing and other business, taking all together, the actual amount does not fall short of $50,000,000 annually."

In November the Lower Union mill of the Carnegie Steel Company, at Youngstown, Ohio, turned out 9600 gross tons of material, beating the best previous record in October by 400 tons.

The Southern Pig Iron Market in 1905.

BY JAMES A. GREEN, CINCINNATI.

The year 1905 was marked by the usual ups and downs in the pig iron market. The downs were all confined to the second quarter of the year. After July 1 it was all up, and as a whole the year has been one of very great and general prosperity in the iron trade. Producers and consumers alike have enjoyed prosperity, and in closing the old year they are looking forward with every anticipation to 1906, expecting great things of it.

It may not be amiss to note that one of the most significant features of the development of the iron trade is the prosperity of the South. Heretofore nearly all of the furnaces which have been built and iron enterprises generally which have been started in the South have been in the nature of pioneer work. There have been some few conspicuous money makers. As a general rule, however, the iron ventures in the South have not been in any way as remunerative as similar ventures in the North. North of the Ohio River the iron trade has made millionaires by the score. The South has not yet produced a single millionaire who has made his money from iron and steel. Immense amounts of money have been lost in the South, frequently because of the lack of experience, sometimes from lack of capital, and sometimes, apparently, simply because great enterprises have been undertaken before the times were ripe for them. The South has developed a consuming market of its own for iron and steel that is already of large proportions, and which is yearly growing. One of the most unquestionable evidences in regard to the development of the South is the fact it has entirely outgrown its labor supply. Everywhere in the iron districts in the South there is a call for more able bodied men; at the present time 25,000 more men could be used in and around the Birmingham district.

In connection with the iron trade the writer thought it would be interesting to keep a record month by month of the general feeling and progress of the market of 1905. This record is as follows:

The Opening Months Disappointing.

January.—The month opened with great expectations. The three preceding months had seen an active, vigorous market, with a buoyant feeling in every department of the trade. It was the confident hope of the makers of pig iron that the buying movement would continue during the month and force prices to a higher level. Prices of Southern iron at Birmingham, Ala., on January 1 were as follows: No. 1 foundry, $14; No. 2 foundry, $13.50; No. 3 foundry, $13; forge, $12.50. Prices of Northern iron were on the basis of $16 for No. 2 foundry at Ohio furnace. As far as new tonnage was concerned the month proved distinctly disappointing, for while there was a steady and regular buying in a small way there was no wholesale purchasing of foundry or forge irons. In the steel department of the business there was great activity, the mills being run to their full capacity, and there were several heavy purchases of Bessemer and basic irons. However, none of the merchant furnaces suffered because the buying was on a minor scale, as their order books were well filled. Several of the Southern furnaces made record shipments during the month, having shipped out more iron than they had ever done before during any similar period. They shipped out not only their current make but also shipped heavily from accumulated stock. It was really a month without noticeable incident and all that can be said as regards the market is that January held its own, prices having changed neither one way nor the other. The month was marked by several blizzards of the worst kind and railroads in many directions were badly tied up, so that shipments made extremely slow time. These storms affected the coke ovens adversely and coke was scarce and high in price.

February.—The second month was marked by hope but not by much real business. The steel makers all over the country were running full, and there was considerable buying of Bessemer and basic irons, but the general foundry trade was slow and stupid. Purchasing of foundry irons was not on a wholesale scale anywhere. Considerable iron was bought, but it was mainly in odd lots. The most remarkable thing about the month was that the market stood the strain and held its own. Ordinarily, 60 days of poor business would mean a break in the market; but prices stayed just where they were when the month began—that is, on the basis of $13.50 for No. 2 foundry at Birmingham. This unusual condition of affairs was due entirely to the widespread and general expectation that the year was going to be a very good one, and that prices were bound to be better later on. Another element is to be considered, and that is that no furnace, North or South, was obliged to sell. Because of the fine order books made during the closing months of 1904 furnaces were able to ship right along and new business was not a matter of absolute necessity. Of course, in certain quarters there was some little uneasiness, but nothing to affect the general situation. The weather during the month was almost uniformly cold, and there was great trouble in getting raw materials.

The Spring Trade Active.

March.—In January and February the Northern furnaces had been holding firmly at $16 for No. 2. This price melted little by little, until in the opening days of March a price of $15.75 and later on a price of $15.50 was made, and there was some scattering business. After the comparative quiet of February in Southern iron March came along like a lion in the market. There was an immense demand, and prices during the month were firm as follows on the Birmingham basis: No. 1, $14; No. 2, $13.50; No. 3, $13; No. 4, $12.75; forge, $12.50. During the earlier months of the year the large consumers had supported the market by heavy, isolated purchases, and this month saw a general buying on the part of small consumers. Lots of from 500 tons down to 50 tons were taken in great numbers, and furnaces were entirely willing to meet the views of consumers as regard deliveries. Iron sold for either immediate shipment or for delivery through the year, just as the consumer specified. This put the order books of the Southern furnaces in very much better shape than they had been, and very materially increased the general optimistic feeling prevailing in the trade. The Northern furnaces did fully as well as the Southern furnaces, although it is odd that in the face of the large buying Northern prices declined from $16 for No. 2 to $15.50. At this price the bulk of the business was done, although in the last week of the month prices were put up to $15.75, and in some cases to $16. The tonnage this month was almost treble that of the earlier months of the year.

April.—The month started with a bad break in the Wall Street stock market, which seemed to have a direct and immediate influence on the demand for pig iron. Prices, however, were not perceptibly changed. The International Harvester Company came into the market with an inquiry for more than 30,000 tons of iron, which they bought mainly from local Chicago furnaces at a concession of about 75 cents below the ruling quotations. This transaction had an immediate and profound influence on the situation. It was supposed at first that it would stimulate buying, particularly as just about the time that this transaction was closed the March statistics were published, showing a decrease in stocks available at the furnaces free for sale. But in spite of statistics the market grew quieter and quieter and the demand fell off abruptly, so that the tonnage of the month was less than any one of the three preceding months. Of course there was some buying, mainly confined, however, to the Far East. In the Middle West new business was practically nil and there were rumors of reduced prices and the situation became decidedly unsettled. Coke had been scarce and 72-hour foundry coke had sold at $3

and more. During the month the ovens all got to going and prices began to sharply drop, so that coke was easy at $2.50.

A Discouraging Period.

May.—The fifth month opened with a feeling of great uncertainty in the trade. Southern No. 2 foundry was freely quoted at $13.25, Birmingham, with some sellers so anxious for business as to be willing to name $13 to desirable trade. The steel business was good and all steel making irons were in great demand. Steel mills this month, as earlier in the year, were working to their full capacity. The foundry trade was good, but foundrymen had anticipated their needs and had supplied themselves more generally than was supposed with pig iron, so that the new trade in foundry iron seemed almost paralyzed. As the month went on, oddly enough there was some considerable buying of coke both by foundries and furnaces, but there was no buying of pig iron at all. Up to this time all the trade reports and all personal views had been highly optimistic. In fact one great authority in the iron trade had predicted that the main trouble of 1905 would be a runaway market and that prices owing to a shortage of raw materials and an unprecedented demand for finished goods would soar to the danger mark. There is no question that scores and scores of producers thought in the first quarter of the year that all conditions favored another gigantic boom and that the history of 1902 would be repeated. In the South particularly $18 for No. 2 foundry by June had been freely predicted and there was talk every now and then when things looked most cheerful of $25 pig iron. But now all at once pessimistic talk began to be loud and frequent. Production was enormous and consumption couldn't keep up with it. The new business that was expected had not materialized and we were doing business on hope and not on solid facts. These were the foundations of the pessimism that all at once, like a contagious fever, seized consumers. It was admitted by everybody that the country generally was prosperous and that the bad slump in Wall Street had not yet affected the real wealth producers and the earning power of labor. In fact labor was in great demand everywhere and wages were high. Crop conditions promised excellently, but the iron trade was suddenly filled with uncertainty and there were predictions that No. 2 foundry would drop with a plunge to $12 and might even go to $10. So, as one man, the consumers stayed out of the market and joined the doleful chorus, predicting trouble ahead. It was all desperately discouraging. In fact, from a producers' and sellers' standpoint, May was hopeless.

June.—When the sellers made up their record for May they found that they had really sold less iron that month than in any month for a number of years previous. On the first of the month the price of Southern No. 2 foundry was nominally $12.50, Birmingham, but any one who actually wanted to buy had no difficulty in obtaining a price of $12. In the same way the price of Northern iron was quotably $15 at furnace, but actual transactions were either $14.50 or $14, depending on the locality. There was no buying at all except some round lots of basic iron which were needed for consumption in June and July. This iron sold at fair prices, although considerably lower than three or four months earlier. Other business was scarcely worthy of the name, as it consisted simply of odd carload lots here and there, which consumers needed in a hurry to fill out their mixtures. All the confidence was gone out of the market and it was very evident that producers and consumers alike were simply drifting with the tide, waiting for something tangible and positive to turn up, so that they might be able to form a fixed and definite policy. It was the hope of all the consumers that three or four large consumers would simultaneously enter the market and buy large lots for the last half of the year, the expectation being that if this were done it would start a buying movement that would re-establish prices and put them on some kind of a firm and solid basis. But June had no such pleasant event up its sleeve, for the month ended without a single heavy consumer buying on a wholesale scale and so stemming the downward current. Instead, values drifted steadily down stream, so that when the end of the month came actual prices were as follows: Southern irons, Birmingham basis: No. 1, $12; No. 2, $11.25; No. 3, $10.75; No. 4, $10.50; forge, $10. Ohio irons, at furnace: No. 1, $14.50; No. 2, $14; No. 3, $13.50. And even these prices, which would have seemed so attractive 90 days earlier, did not awaken any enthusiasm. The only buying was on the part of those who actually needed iron for quick shipment. However, the end of the month was marked by a magnificent inquiry. Dozens of consumers asked for prices. But they did not really mean business. All they wanted was to know what might actually be done in the way of prices and when this information was obtained they crawled back into their holes, so to speak, and joined the general waiting movement. So the month ended in dullness and disappointment, yet with the hope on the part of sellers that consumers in the not distant future would have to go into the market.

A Rush to Buy.

July.—When the heavy buying movement occurred in the opening months of the year there was a general expectation on the part of the furnaces that before the middle of the year very much higher prices would prevail. The consequence of this was a decided disinclination to sell very far ahead. Makers in many instances limited sales to delivery over the first quarter of the year; others to the first half. At that time had the furnaces been willing a great deal of iron could have been sold for shipment over the entire year. As a matter of fact, however, but very little iron was sold for shipment beyond July and the bulk of the iron sold at that time was for shipment not later than April. Hence, when we began to get fairly into the second quarter of the year and the market grew dull the furnaces commenced to run out of shipping instructions. As a necessary sequel iron accumulated on the furnace yards. On July 1 the situation seemed desperate. There had been no real business for 90 days; there was a great pressure to sell and Southern prices were so weak that by the 10th of the month Southern No. 2 Foundry was sold at $10.50, Birmingham; other grades in proportion. Then came on the most startling, unexpected buying movements that the trade has seen for a number of years. One large consumer came into the market and bought to exceed 50,000 tons of Southern iron. This transaction set the ball rolling, and by the 25th of the month upward of 200,000 tons of Southern iron were sold in the Cincinnati market alone, while a number of the Ohio furnaces had sold their entire product for the balance of the year. Business came so fast that it was difficult to take care of it. All kinds of iron were sold and in all kinds of quantities. Buyers were willing and anxious to purchase, not only for the last half of 1905, but in some cases for the first half of 1906. The feeling in the trade seemed to revolutionize over night, and hopefulness and optimism were everywhere in evidence. As a matter of fact the general business of consumers had been good right along. They had stayed out of the market when the statistics showed iron was accumulating, waiting to buy at the bottom, and then they all came into the market together. The agricultural implement people were very heavy buyers and their example powerfully influenced others. When July closed furnaces North and South had their order books again well filled and their views of prices had very materially stiffened, and all the clouds that had hung over the sky when July first opened had cleared away. The ruling prices on the last day of the month were as follows: Southern No. 1, $12.50; No. 2, $12; No. 3, $11.50; Forge, $11. Ohio No. 1, $15; No. 2, $14.50; No. 3, $14.

August.—This was a month of fine, though not exceptional, business. Prices remained stationary, quotations on the last day of the month being the same as on the first day. There were many attempts on the part of large buyers at the close of the month to beat down prices by offering to take large lots for forward shipment, but these efforts were all in vain. The buyers found the furnaces were willing to sell at the ruling prices as far ahead as through the first quarter of 1906, and that was the best

that they would do. Quite a heavy tonnage was sold for forward shipment. There was also a decided movement in the gray forge and low grade Southern irons which had accumulated. The high grade soft Southern irons were comparatively scarce. Taking the month as a whole, it is probable that the furnaces just about sold their output, so business might be said to have been normal. The month was characterized by the best of feeling in every direction. There was none of the feverish wear and tear that in previous years had made the iron business such a trying matter. On the contrary, buyers and sellers were in thorough good humor with themselves and the world in general, and while they were proceeding cautiously yet there was a universal optimistic sentiment. Every one felt that good times were really here, and that better times were just ahead.

Perhaps the Greatest Buying Movement Ever Known.

September.—This month saw one of the greatest buying movements that the market has ever known. It came almost without warning. The month began with the same fine steady buying that had marked August. There was nothing very sensational about the transactions. Day by day the business came along, and it seemed as if the month would prove very satisfactory, but that there would be nothing of particular note about it. About the 10th of the month, however, there came a sudden spurt. The cast iron pipe interests quietly came into the market and purchased in the neighborhood of 100,000 tons of iron. This started things going with a rush, and all classes of consumers purchased in large and small lots. The Northern furnaces were filled up first. The Southern furnaces took everything that came along on the basis of $12, Birmingham, for No. 2 foundry, most of them for shipment not beyond March, although in a few cases sales for the entire first half of 1906 were made. Finally, however, even the Southern furnace companies had to withdraw from the market in order to find where they stood and to make a readjustment not only of their order books but of their prices. About the 20th of the month the accepted prices were advanced as follows: Southern No. 1, $13; No. 2, $12.50; No. 3, $12; forge, $11.50. Northern, No. 1, $16; No. 2, $15; No. 3, $14.50. This advance in price did not check business at all. On the contrary, buyers recognized the fact that the furnaces had withheld putting up quotations an unusually long time, and they knew that never in the history of the trade had an advance in the trade been more thoroughly justified than in this case. The advance served to stimulate rather than to check purchasing, and the month closed with the furnaces who were still willing to sell doing a very large business. Some furnaces, however, withdrew entirely from the market by putting their prices up a dollar or so above the ruling quotations. Throughout all branches of the trade there was great optimism. Both consumers and producers felt that we were not only having very good times, but we were on the threshold of much better times. As the month progressed there were many predictions that before the winter was well over pig iron would have scored a further heavy advance. Of course, there is never anything absolutely perfect in this world, and the producers toward the end of the month began to be very nervous. In the North ironmasters found the price of coke sharply advanced, and there were disquieting rumors of advance in ore. So, while they had sold considerable iron for the year 1906, they faced the prospect of a decided advance in their cost. In the South, of course, as nearly all the producers control their own supply of raw materials, this was not an item. But there was a growing scarcity of labor in Tennessee and Alabama, so that a great many of the iron companies were seriously crippled. They were not able to get out enough coke or enough ore, and there was much disturbance of regular operations on this account.

A Month When Resources Were Strained.

October.—The tenth month ended with the following prices in force: Southern No. 1, $14.50; No. 2, $14; No. 3, $13.50; forge, $13. Northern No. 1, $17; No. 2, $16.50; No. 3, $16. This very decided advance tells in a graphic and decisive way the story of the month. Southern No. 2 foundry iron was selling at $12.50, Birmingham, when October opened and an enormous tonnage was booked at this price. Furnaces were getting more business than they could comfortably handle and stopped the buying to gain time to breathe and put prices to $13, but there was no halting place even at $13 and the market naturally sought a $14 base. This price really did call a halt, but it was only a temporary matter, for buying started in again with a rush. Several times had it seemed since the buying began in July as if the absorbing quality of the market had been exhausted and as if all the pig iron had been taken that consumers could handle. But each time it soon became very evident that this was an entire misapprehension and that the consuming power of the country was beyond the ordinary expectation. In fact the great feature of the market during the fall months was the rate at which consumption was going on. Without any question all records were broken. Concern after concern that thought it had bought enough iron to run it the balance of the year found it was using more iron than it had anticipated and was obliged to come into the market. Others that had covered themselves well ahead took on additional contracts and, unwilling to take chances on the market, bought pig iron to cover. There was no speculative boom about current transactions. On the contrary they were all based on actual needs. There were many producers who looked upon the rapid advance of the market with much apprehension. They felt that it was getting away from them and that it would be better for prices to be maintained at a lower level. No matter how sincerely producers held this opinion they were powerless, for the buyers kept pouring into the market in steady flood. Consumers were making the market themselves and producers had nothing to say about it. If they determined not to sell, presently consumers would commence to bid for their iron. October was a month of many sensational features—a month of larger consumption both of iron and steel than the country had known before, and every furnace, foundry and mill was strained to the utmost to keep up with the demands made upon it. Toward the latter part of the month much trouble was experienced because of a shortage of cars, particularly in the coke districts. The railroads could only move freight slowly, being blocked by too heavy traffic, and there were all the other troubles incident to an expansion of business beyond the ordinary facilities with which to do it. There was excitement and a feverish expectancy in the market. The most optimistic began to predict $20 pig iron before the winter was over and prophets of this kind found many to listen to them with willing ears.

A Wonderfully Even Period.

November.—The market traveled along a fairly level road in November without any decided uphill in it and certainly no down hill. Southern prices were not changed during the month, as No. 2 foundry remained at $14, Birmingham, although some of the Southern iron companies which were very well filled up with orders marked their quotations up to the basis of $14.50. Northern No. 2 foundry went from $16.50 to $17 and finally to $17.50 during the month. By comparison with the months that preceded it business was not large; but as a matter of fact, leaving comparison with boom conditions out of the question, November's tonnage was exceedingly good. Business was brisk and steady from day to day, transactions, however, being nearly all of minor volume. There was nothing to disappoint any one in what business was going, because the prices obtained were highly profitable; yet in a way the month to many producers must have been of the hope deferred nature. October broke so many precedents and the volume of business was so tremendous that there was very general expectation that prices during this month might strike the $20 notch. There was no let up at all in consumption. On the contrary, every iron melting concern in the country was running to its utmost capacity. To put it succinctly, November was a month of a fine business in every possible way, even if it did not come up to the anticipation of those who expected a great deal more than they had a real reason to look for, and whose ex-

pectations had they been realized would in the long run have proved disastrous.

December.—This was a wonderfully even month, in which absolutely nothing of any moment happened—that is, there was nothing in the nature of a boom, there was nothing spectacular, but it was a month in which genuine prosperity was very much in evidence. Consumers and producers were both tremendously busy, but they were mainly occupied with old business, no new contracts of great importance having arisen. This is entirely natural and was to have been anticipated, as the end of the year is the time for closing up things and not for starting things afresh. However, there was some considerable buying right along and prices were on the basis of $17.50 for Ohio No. 2 Foundry and $14.50 for Birmingham No. 2 Foundry, with possibly some few sellers occasionally slightly changing these quotations for spot material. Fortunately the month was marked with ideal weather—not a single blizzard, not a single snow storm, but for the most part clear, bright, beautiful days that did not interfere with outdoor work. Consequently there was not as much trouble in the coke fields as was anticipated, although there was a serious shortage of cars, so that in some of the districts in the South furnaces were not able to ship more than half their normal output, although they could have turned out 100 per cent. of their capacity but for the lack of shipping facilities.

Customs Contentions.

Steel Strips.

Whether or not an additional duty of 1 cent per pound is applicable to steel strips continues to be a subject of controversy between the Government and importers. Many importers of strips are wondering if the classification of this kind of merchandise will ever be settled. The latest litigant to appear in the role of a protestant is the Joseph F. McCoy Company, which recently appealed to the Board of United States General Appraisers for a reversal of the New York collector's action in demanding an additional duty on strips described as cold rolled, blued, brightened and tempered. In its official protest filed with the customs tribunal the firm has this to say:

> The collector has assessed a duty of 1 cent per pound, presumably under paragraph 141, in addition to other rate or rates on certain iron and steel. Said merchandise is not covered by, nor dutiable under, the said paragraph nor any portion thereof. It is alternatively claimed that if it be dutiable thereunder it should pay only 1 cent per pound in addition to the rates provided in the act of 1897 for common or black finish plates, strips or sheets.

In an opinion written by I. F. Fischer the board on December 27 found adversely to the claims of the McCoy Company. In overruling the claim the board lays down an interpretation of the tariff law which is of general interest to importers of strips. It says in part:

> If the concluding sentence just quoted is to be interpreted as a claim that the strips are dutiable primarily at other rates than those assessed, such claim must be overruled for vagueness. It fails to point out any provision in the tariff for common or black finish strips, nor is any rate of duty suggested at which they might be dutiable. Both parties agree that the articles are steel strips, cold rolled.
>
> We are of opinion, in respect to the claim that the goods are not liable to additional duty under paragraph 141, that the evidence offered on the part of the importers in support of such claim is wholly insufficient. In the returns of the appraising officer on the various invoices made at the time of the examination of the goods and with the goods before him, he described the strips as "tempered and blued," "cold rolled and polished," "cold rolled and brightened," "blued and brightened," "tempered and polished," and "tempered, blued and brightened," respectively. Against this full and detailed official description of the articles as actually imported we have nothing but the statement of the importer, relying on his memory, unsupported by any other evidence, and unaccompanied by any samples of the strips, that they were not tempered, blued, brightened, polished, &c.
>
> On this record we cannot find that there was any error in the classification of the goods, and the decisions of the collector thereon are hereby affirmed, the protests being overruled.

Steel Wool or Steel Shavings.

The Treasury Department has decided not to await a decision by the United States Circuit Court of Appeals regarding the rate of duty applicable to steel wool or steel shavings, but to institute immediately new litigation, with the hope of winning the contention that the article is properly dutiable under the Dingley tariff law at the rate of 45 per cent. With this object in view the Treasury authorities at New York have selected an importation of steel wool made by the Buehne Steel Wool Company, and a hearing will be given before the Board of United States General Appraisers February 2. The controversy is one of more than usual interest owing to the fact that a suit and countersuit involving the classification of the wool are pending in the United States Circuit Court of Appeals. Prior to this litigation the question of the classification of steel wool had engaged the attention of importers and customs officers for a long period.

The cases now pending in the appellate tribunal had their inception in a test brought before the Board of Appraisers early last year, when the lower tribunal rendered a decision which was in the nature of a compromise. The Government had contended for a duty of 45 per cent., whereas the Buehne Company insisted that the merchandise came within the meaning of paragraph 137 of the tariff act providing for the assessment on articles manufactured from steel wire worth less than 4 cents per pound. The board and the court found that the wool was dutiable under paragraph 135 as "steel in all forms and shapes not specially provided for." The pending cases in the Court of Appeals may be argued next month, but if they go to trial and decisions are rendered by the court the Government will acquiesce in order that the new test case may be judicially passed upon. It is understood that domestic producers of steel wool have had a good deal to do with the determination of the Treasury Department to reopen the issue. The American manufacturers will co-operate with the Government in the attempt to legalize the collection of a 45 per cent. duty on steel wool imported from abroad.

The New Board President.

The Secretary of the Treasury has appointed Marion De Vries president of the Board of United States General Appraisers for the calendar year 1906. The new executive has assumed his official duties, succeeding I. F. Fischer, who retires after a year's service. As president of the General Board Mr. De Vries will assign members of the customs tribunal to hear importers' reappraisement and classification appeals in all sections of the country. He will be in charge of the board's clerical force and have other responsibilities, for which, however, he will receive no further remuneration than the salary of $7,000 which he is paid as a general appraiser. Mr. De Vries was a Representative in Congress from California for several terms and was nominated a member of the customs court by the late President McKinley.

The Work of the Customs Court in 1905.

An official statement has been issued by the Board of United States General Appraisers dealing with the work of the Customs Court during 1905. The number of hearings held and opinions written exceeded those of any previous year in the history of the board. The report shows that the tribunal decided 32,939 importers' protests and 5071 appeals for reappraisements. There were pending on the suspended files at the close of the year 60,000 protests awaiting decision by the courts of questions raised on appeal. Members of the general board visited 70 ports last year for the purpose of reviewing appeals made by importers against classification and reappraisement decisions returned by Treasury officials. The statement was made that the board is granting prompt relief to importers in all lines. Whatever delay exists in customs litigation is attributed to the Federal courts.

The fourth annual collation and entertainment of the Hyatt Roller Bearing Company, Harrison, N. J., will be held on Wednesday evening, January 17, in the grand ballroom of the Waldorf-Astoria. The gathering, like those preceding it, which this company has made an annual event, will be informal to the extent that there will be no long prearranged speeches, and the vaudeville entertainment that accompanies it will be most interesting.

The Strang Oil Engine.

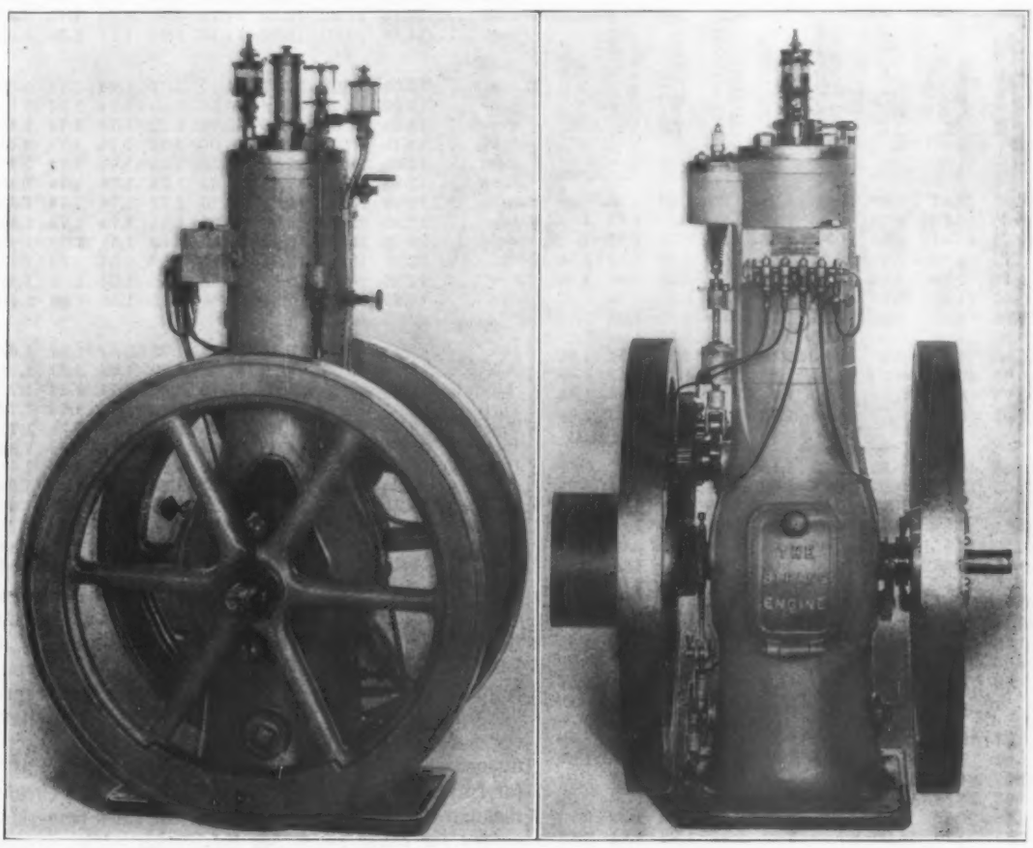
The description of the Strang gas engine which appeared in *The Iron Age* October 12, 1905, would apply in many particulars to the oil engine illustrated. This is made by the same manufacturer, the Strang Engine Company, 140 Dearborn street, Chicago, Ill. The principal differences are that the oil engine is of upright instead of horizontal pattern, and is equipped with a fuel feeding system, which of course is not required on a gas engine. An important characteristic of the engine is that it is capable of burning distillate, stove naphtha and gasoline with as good or better economy than is obtained with kerosene, and it may also be operated on plain or crude petroleum of as low a grade as 59 per cent. The ability to use such fuel is due to the scavenging action provided to keep the cylinder and valves clean, which passes the soot and tar out through the exhaust pipe and prevents their clogging the ports and passages. The engine is claimed to be able to use Australian oil satisfactorily, which is of so low a grade as to be unfit for use in most oil engines. Another feature of the engine is that it may be easily converted into a gas engine by disconnecting the oil pipe and connecting a gas hose.

When supplied with kerosene oil the consumption of the engine is given as 0.88 pound per brake horse-power per hour in the small sizes and about ¾ pound in the larger engines. A number of tests have been made with Pennsylvania, Ohio and Indiana crude oils costing about 90 cents per barrel, in which the average consumption was about one pound of oil per brake horse-power per hour, and in some cases, according to the quality of the oil, six pounds of oil per hour gave 6½ brake horse-power. In running on cheap distillate the consumption is also about one pound per brake horse-power per hour.

The oil engines are frequently furnished in combination with duplex pumps with geared drive and are stated to give the following duties: The 5 horse-power set will pump 2800 to 3000 gallons of water per hour against a head of 150 feet, using 4¼ gallons of kerosene in ten hours, and a 7 horse-power set pumping 5000 gallons per hour against a 150-foot head will use six gallons of kerosene in ten hours.

These oil engines are fitted with automatic feed and governing device for regulating the speed according to the load and are arranged so that the speed may be altered and set to continue at the required rate. All parts of the engine are accessible and it runs with practically no vibration and almost noiselessly. Electric ignition is provided. The engine is automatic in all respects, so that it requires little attention. Lubricating oil is pumped automatically through a large sight feed cup at the top of the engine and is distributed through several separate ducts to the parts requiring constant lubrication.

A point on which some emphasis is laid is the short time required to put the engine in full operation. The inventor claims that whereas an oil engine ordinarily requires 15 to 30 minutes to start, the Strang engine may be started in from two to three minutes, or as soon as sufficient heat is generated to volatilize the kerosene. When the oil is of a very low grade the engine must then be started on stove oil or distillate until the cylinder is well heated, after which the regular fuel may be turned on. This has proved to be the best and quickest way, although it is claimed to be possible to start direct on crude or fuel oil without the use of naphtha. It is usual to provide a separate gasoline tank for holding the fuel oil and to have one corner of this reserved for holding a small tank containing distillate or naphtha for starting.



Two Views of the Oil Engine Built by the Strang Engine Company, Chicago, Ill.

The engines are made in sizes of 3, 5, 7, 8 and 10 horse-power. Larger sizes up to 30 horse-power are built to order. A number of the engines have been in successful operation for over a year, driving pumps, dynamos and machinery of all kinds. A slightly modified type constructed for launches and motor boats has a novel feature in its reversing mechanism by which the thrust from the propeller keeps the clutch in gear when running either ahead or astern.

It is estimated that the total amount of anthracite coal which has been produced in the United States since 1814, the earliest year on record, is 2,756,175,000 tons, to which magnificent total the year 1814 contributed just 22 tons.

Fluctuations in the Prices of Iron and Steel Products, 1897-1905.

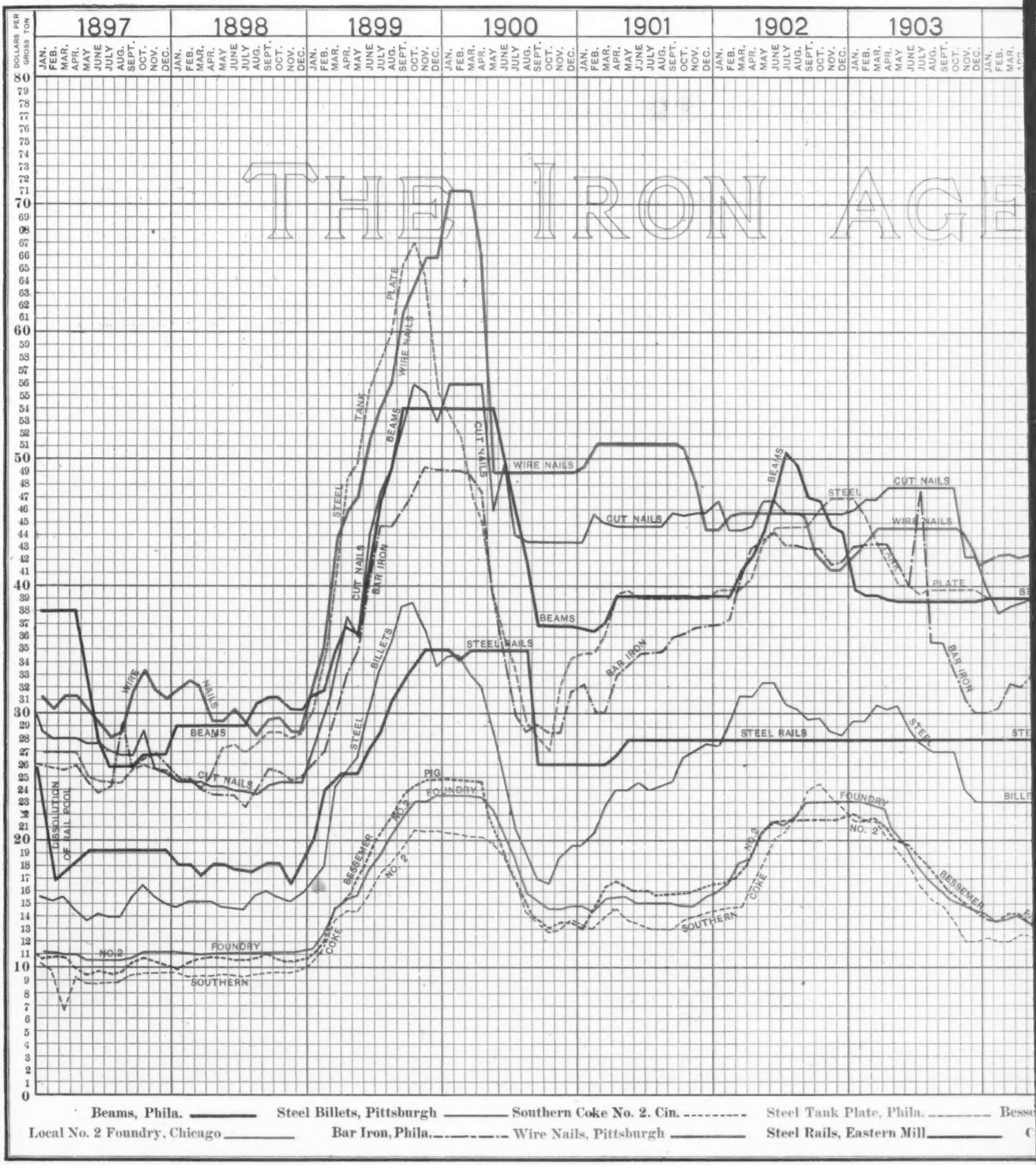
[*With Supplement.*]

On the accompanying colored chart are plotted lines indicating the fluctuations in prices of pig iron, steel billets and various finished forms of iron and steel for 1905 and the eight years preceding. Monthly averages have been computed from the weekly quotations as given in the market reports of *The Iron Age*, and the various distributing centers are represented. In the tables below the monthly average prices are given for Bessemer pig iron at Pittsburgh, Southern No. 2 Foundry iron at Cincinnati, Local No. 2 Foundry iron at Chicago, Bessemer steel billets at Pittsburgh, tank plates, refined bar iron and beams at Philadelphia, and cut nails and wire nails at Pittsburgh.

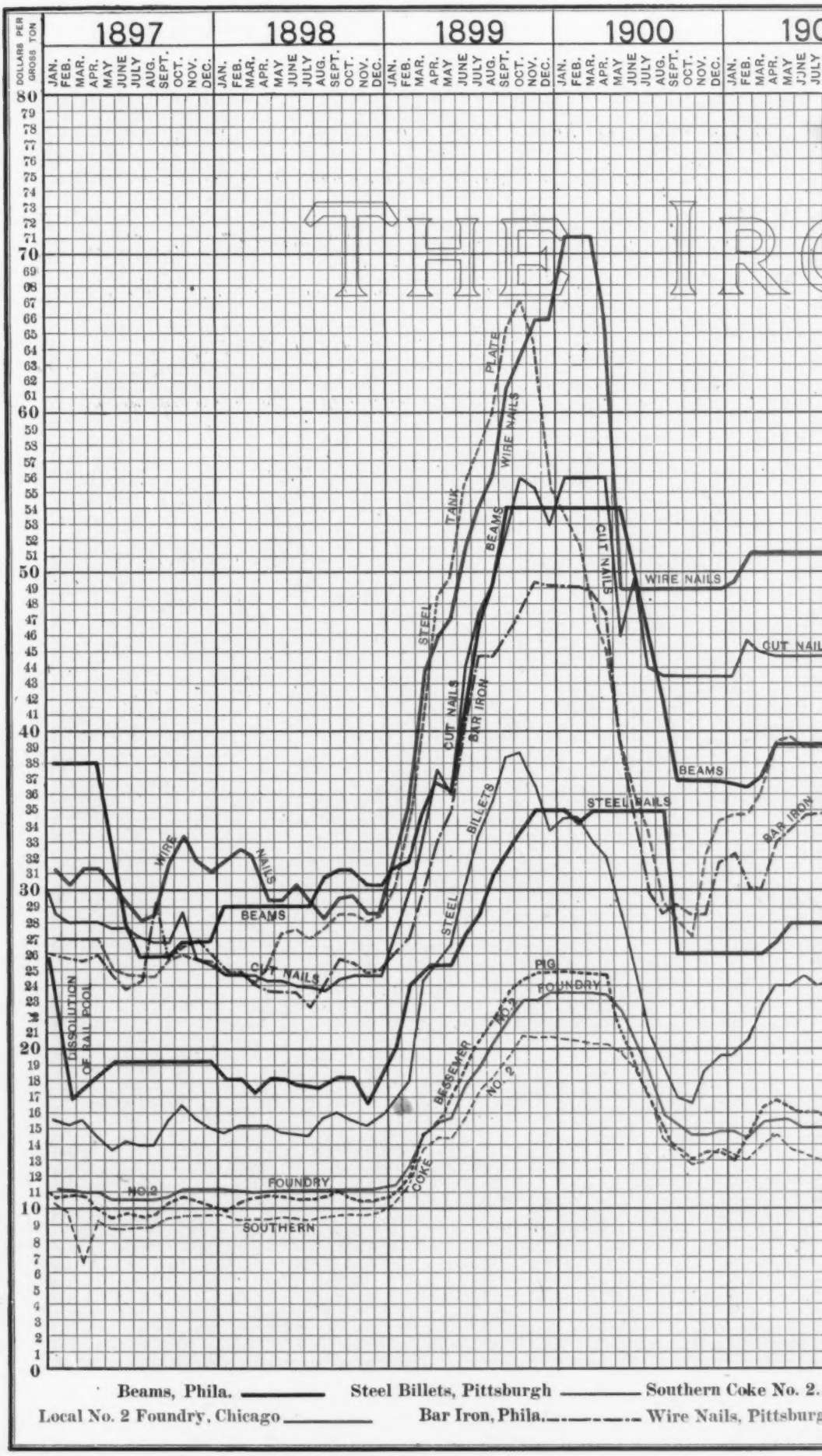
Months.	Bessemer pig, Pittsburgh.	Steel billets, Pittsburgh.	So. No. 2 foundry, Cincinnati.	Local No. 2 foundry, Chicago.	Cut nails, Pittsburgh.	Tank plate, Philadelphia.	Beams, Philadelphia.	Ref'd bar iron, Philadelphia.	Wire nails, Pittsburgh.
1897									
Jan.	10.56	15.42	10.00	11.02	1.28	1.20	1.70	1.15	1.39
Feb.	10.60	15.25	9.75	11.00	1.25	1.20	1.70	1.15	1.35
March	10.52	15.44	9.69	10.88	1.25	1.20	1.70	1.14	1.40
April	9.82	14.60	9.25	10.75	1.25	1.20	1.70	1.15	1.40
May	9.32	13.82	8.75	10.38	1.23	1.11	1.49	1.10	1.35
June	9.56	14.06	8.75	10.25	1.23	1.10	1.25	1.07	1.31
July	9.25	14.00	8.95	10.25	1.20	1.10	1.15	1.08	1.25
Aug.	9.33	14.00	9.00	10.25	1.19	1.08	1.15	1.08	1.25
Sept.	10.09	15.60	9.35	10.40	1.19	1.14	1.15	1.14	1.41
Oct.	10.45	16.44	9.50	11.00	1.28	1.15	1.20	1.19	1.49
Nov.	10.23	15.57	9.50	11.00	1.14	1.14	1.20	1.20	1.41
Dec.	10.01	15.00	9.50	11.00	1.12	1.13	1.20	1.15	1.39
1898									
Jan.	9.87	14.93	9.50	11.00	1.10	1.10	1.30	1.11	1.42
Feb.	10.05	15.06	9.25	10.93	1.10	1.10	1.30	1.11	1.45
March	10.39	15.25	9.25	10.75	1.10	1.08	1.30	1.06	1.43
April	10.41	15.06	9.25	10.91	1.08	1.12	1.30	1.05	1.31
May	10.30	14.85	9.37	11.00	1.08	1.21	1.30	1.05	1.31
June	10.34	14.65	9.30	11.00	1.06	1.23	1.30	1.05	1.35
July	10.25	14.50	9.25	11.00	1.06	1.20	1.30	1.00	1.31
Aug.	10.35	15.85	9.37	11.00	1.05	1.23	1.37	1.06	1.26
Sept.	10.78	16.00	9.55	11.00	1.08	1.27	1.40	1.14	1.32
Oct.	10.36	15.56	9.75	11.00	1.10	1.27	1.38	1.13	1.33
Nov.	10.15	15.06	9.75	11.00	1.10	1.25	1.35	1.10	1.28
Dec.	10.58	15.80	9.90	11.00	1.10	1.26	1.35	1.11	1.27
1899									
Jan.	10.87	16.62	10.31	11.12	1.18	1.35	1.40	1.15	1.43
Feb.	11.60	18.00	11.69	12.12	1.32	1.55	1.42	1.20	1.57
March	14.59	24.30	13.75	14.60	1.48	1.89	1.55	1.41	1.94
April	15.03	25.37	14.50	15.12	1.67	2.18	1.64	1.50	2.05
May	16.20	26.75	14.56	15.37	1.65	2.23	1.63	1.56	2.10
June	18.51	30.10	16.00	17.60	1.97	2.48	1.82	1.81	2.30
July	20.65	33.12	17.56	18.87	2.12	2.58	2.08	2.00	2.42
Aug.	21.75	35.40	18.35	20.30	2.20	2.72	2.20	2.00	2.50
Sept.	23.43	38.37	19.94	21.87	2.45	2.92	2.40	2.05	2.76
Oct.	24.18	38.75	20.75	23.00	2.50	3.00	2.40	2.13	2.87
Nov.	24.78	36.50	20.75	23.10	2.48	2.87	2.40	2.21	2.95
Dec.	24.90	33.75	20.75	23.50	2.45	2.48	2.40	2.20	2.95
1900									
Jan.	24.90	34.50	20.69	23.50	2.50	2.38	2.40	2.20	3.20
Feb.	24.80	34.87	20.50	23.50	2.50	2.32	2.40	2.20	3.20
March	24.72	33.00	20.30	23.50	2.50	2.10	2.40	2.18	3.20
April	24.70	32.00	20.19	23.37	2.50	2.02	2.40	2.12	2.95
May	21.00	28.90	19.75	22.30	2.05	1.75	2.40	1.77	2.20
June	19.72	27.25	18.75	20.37	2.05	1.60	2.22	1.56	2.20
July	16.75	21.00	16.81	18.25	1.97	1.37	2.05	1.33	2.20
Aug.	15.60	18.20	14.25	15.90	1.95	1.30	1.89	1.28	2.20
Sept.	13.87	16.93	13.62	15.00	1.95	1.25	1.65	1.30	2.20
Oct.	13.06	16.50	12.87	14.50	1.95	1.21	1.65	1.28	2.20
Nov.	13.48	18.95	12.95	14.50	1.95	1.44	1.65	1.28	2.20
Dec.	13.43	19.75	13.75	14.75	1.95	1.54	1.65	1.42	2.20
1901									
Jan.	13.15	19.75	13.45	14.75	1.95	1.55	1.65	1.44	2.22
Feb.	14.43	20.31	13.12	14.25	2.05	1.55	1.63	1.35	2.30
March	16.31	22.88	14.00	15.25	2.01	1.62	1.66	1.35	2.30
April	16.75	24.00	14.50	15.50	2.00	1.76	1.75	1.47	2.30
May	16.30	24.00	13.85	15.50	2.00	1.78	1.75	1.51	2.30
June	16.00	24.38	13.37	15.00	2.00	1.75	1.75	1.55	2.30
July	16.00	24.00	13.00	15.00	2.00	1.75	1.75	1.55	2.30
Aug.	15.75	24.20	13.00	15.00	2.00	1.75	1.75	1.56	2.30
Sept.	15.75	24.88	13.06	15.00	2.05	1.75	1.75	1.61	2.30
Oct.	15.89	26.70	13.75	14.75	2.04	1.75	1.75	1.62	2.28
Nov	16.00	27.00	14.00	14.88	2.05	1.75	1.75	1.64	2.17
Dec.	16.31	27.50	14.25	15.50	2.05	1.75	1.75	1.65	1.99
1902									
Jan.	16.70	27.50	14.55	15.90	2.05	1.78	1.75	1.66	1.99
Feb.	16.93	29.37	14.75	16.50	1.95	1.78	1.75	1.68	2.05
March	17.37	31.25	14.75	18.16	1.95	1.78	1.85	1.84	2.05
April	18.75	31.50	16.87	18.62	1.96	1.81	1.90	1.92	2.05
May	20.75	32.20	18.35	20.50	2.05	1.95	1.99	1.96	2.05
June	21.56	32.37	20.19	21.50	2.05	2.00	2.11	1.99	2.05
July	21.60	31.75	20.75	21.25	2.05	2.00	2.27	1.95	2.05
Aug.	21.62	31.06	23.06	21.75	2.05	2.00	2.21	1.93	2.05
Sept.	21.75	29.50	25.00	23.00	2.05	2.00	2.10	1.92	2.03
Oct.	21.75	29.70	25.65	23.00	2.05	2.06	2.09	1.93	1.89
Nov.	21.68	28.50	23.62	23.00	2.05	2.10	2.00	1.87	1.85
Dec.	21.75	29.12	22.44	23.00	2.05	2.10	1.97	1.92	1.85
1903									
Jan.	22.15	29.60	21.65	23.10	2.07	2.10	1.78	1.93	1.89
Feb.	21.45	29.87	21.50	23.00	2.10	2.05	1.75	1.93	1.92
March	21.85	30.62	21.37	22.87	2.10	1.94	1.75	1.94	2.00
April	21.28	30.25	20.15	22.52	2.15	1.85	1.74	1.93	2.00
May	20.01	30.37	18.87	20.37	2.15	1.80	1.73	1.86	2.00
June	19.72	28.87	17.75	19.50	2.15	1.78	1.73	1.79	2.00
July	18.89	27.60	16.15	17.90	2.15	1.77	1.73	1.69	2.00
Aug.	18.35	27.00	15.19	16.87	2.15	1.78	1.73	1.60	2.00
Sept.	17.22	27.00	14.75	16.06	2.15	1.78	1.73	1.60	2.00
Oct.	16.05	27.00	13.50	15.35	2.15	1.78	1.73	1.50	2.00
Nov.	15.18	24.00	12.00	14.75	1.90	1.78	1.73	1.40	1.97
Dec.	14.40	23.00	12.05	14.46	1.90	1.77	1.73	1.35	1.87
1904									
Jan.	13.91	23.00	12.37	14.12	1.77	1.74	1.74	1.35	1.89
Feb.	13.66	23.00	12.12	13.56	1.70	1.74	1.74	1.36	1.90
March	14.25	23.00	12.10	13.70	1.72	1.74	1.74	1.45	1.91
April	14.18	23.00	12.50	14.00	1.74	1.74	1.74	1.48	1.90
May	13.60	23.00	12.25	13.50	1.75	1.74	1.74	1.48	1.90
June	12.81	23.00	11.80	13.35	1.75	1.74	1.74	1.48	1.90
July	12.40	23.00	11.81	13.25	1.72	1.74	1.74	1.48	1.89
Aug.	12.81	23.00	12.00	13.25	1.65	1.74	1.74	1.48	1.71
Sept.	12.63	20.00	12.00	13.50	1.60	1.58	1.58	1.45	1.60
Oct.	13.10	19.50	12.81	13.75	1.60	1.54	1.54	1.43	1.60
Nov.	14.85	20.25	15.19	15.63	1.62	1.54	1.54	1.47	1.62
Dec.	16.65	21.20	15.85	16.60	1.73	1.58	1.58	1.60	1.73
1905									
Jan.	16.85	22.75	16.25	17.50	1.75	1.64	1.64	1.65	1.75
Feb.	16.41	23.50	16.25	17.50	1.79	1.67	1.67	1.68	1.80
March	16.35	24.00	16.25	17.45	1.80	1.74	1.74	1.73	1.80
April	16.35	24.00	16.25	17.25	1.80	1.74	1.74	1.73	1.80
May	16.16	23.50	15.81	17.25	1.80	1.74	1.74	1.71	1.80
June	15.65	22.00	14.65	16.65	1.80	1.74	1.74	1.63	1.74
July	14.85	22.00	13.94	16.12	1.80	1.74	1.74	1.63	1.70
Aug.	15.20	24.00	14.40	16.25	1.66	1.74	1.77	1.63	1.70
Sept.	15.91	25.00	14.37	16.25	1.60	1.74	1.89	1.66	1.74
Oct.	16.54	25.62	15.31	17.31	1.65	1.74	1.88	1.78	1.80
Nov.	17.85	26.00	16.60	18.80	1.65	1.74	1.84	1.83	1.80
Dec.	18.35	26.00	16.75	19.25	1.71	1.74	1.84	1.83	1.80

It is to be noted that all the price lines plotted on the diagram refer to gross tons, the prices being indicated on the margin. In this way the direct relation is shown between the prices of raw semifinished material and rolling mill products. In the case of the line representing the fluctuations in beams, Philadelphia, in 1905, the curve for August, September and October shows the influence of premiums paid in that period. The mill price for future delivery remained the same from February on through the year. The courses of the lines traversing the spaces for other years are interesting. The extreme of low prices was reached in 1897, not in the early years of the depression of the nineties, as commonly supposed. The tremendous up-turn of prices in the boom of 1899 is made very prominent by the sharp descent of the lines in 1900. The moderation of prices in more recent years appears in the absence of any abrupt ascents and is in marked contrast with the record for 1899.

Remarkable Machine Work on a Break Down Job.—On December 13, at 1 p.m., a large fly wheel, built about 30 years ago by the Corliss Steam Engine Company, Providence, R. I., in use in one of the mills of the Oliver Iron & Steel Company, Pittsburgh, burst, breaking the shaft and pillow blocks. At 2 p.m. the same day, Mackintosh, Hemphill & Co., Pittsburgh, were given the order for a new 54-ton, built-up fly wheel, 24 feet in diameter; also new shaft and pillow blocks, all for quick delivery. The shaft, weighing 15 tons, was forged by the Midvale Steel Company, Nicetown, Philadelphia, and shipped with tracer traveling on the car. Three segments of the wheel were cast each day until completed and the entire job was bored, turned, fitted and the last shipment made on December 28. The fly wheel was cast, bored, fitted and turned in 10½ days after molding began on the first piece. The entire job was erected in place and the mill started on the morning of January 2.



Fluctuations in the Prices of Crude and Finished Iron from January 1, 1897, to January 1, 1906—Gross



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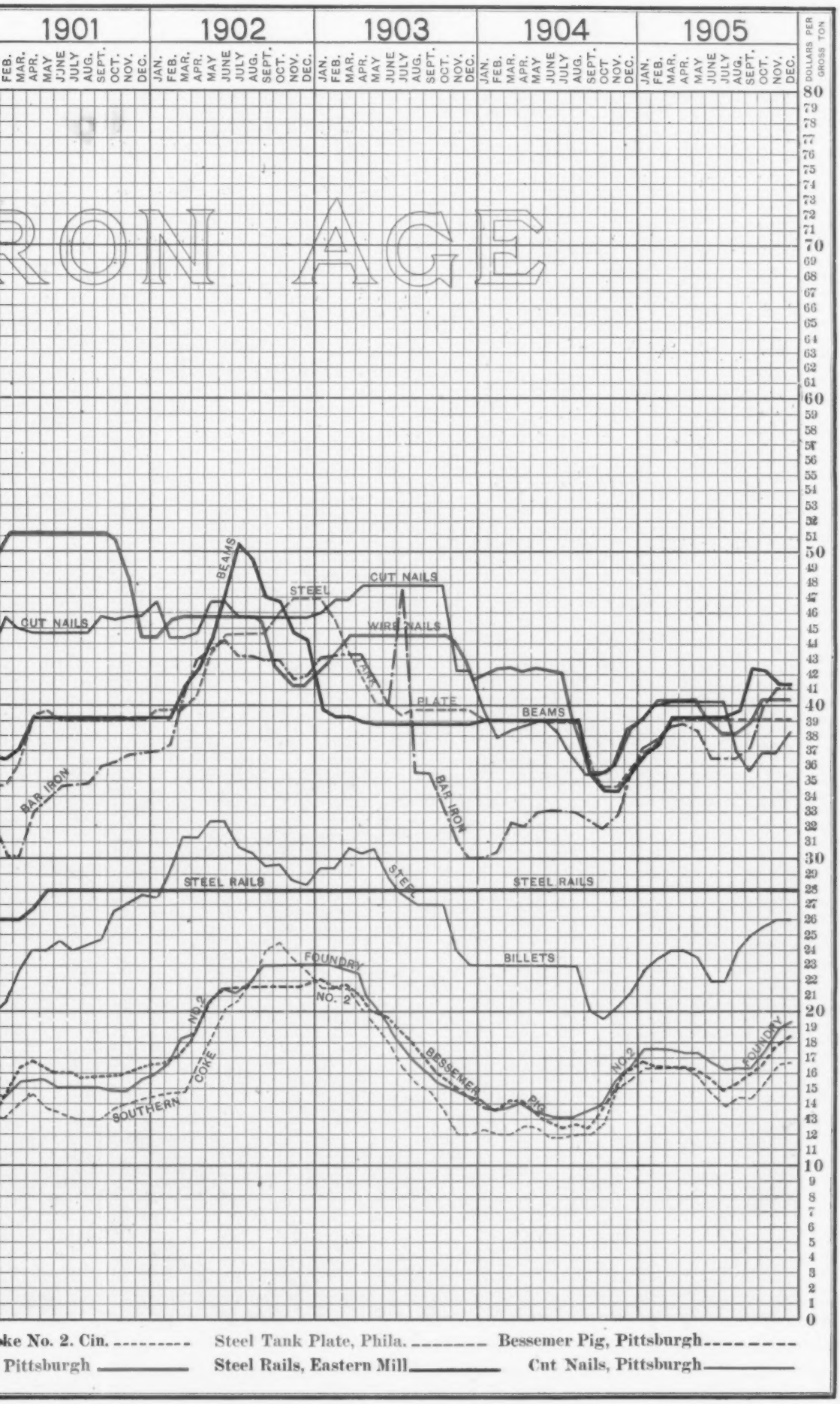
from January 1, 1897, to Jan



Crude and Finished Iron and Steel
January 1, 1906—Gross Tons.

Forms of Concrete Reinforcement.

The use of steel in connection with concrete for building purposes of every description is becoming so widespread that a discussion of the forms of metal most widely used for reinforcement in connection with concrete may not be out of place at this time. The oldest application of reinforced concrete was a boat with sides 1½ inches thick exhibited by Lamont, its builder at the Paris Exposition of 1855. The boat was formed from a wire network with concrete reinforcement. It is said that it is still in use in the park of the City of Miraval, in central France. Francois Monier was granted patents covering practically all the uses to which armored concrete is put to-day, as his patent covered broadly the use of steel reinforcement and concrete and his application was accompanied by hundreds of drawings showing varied forms of combination and application. So broad were his patents that for a time all other applications in European countries were denied. But the Monier patents were later voided when it was proved that some one else had been in the field before him.

Ten years later Thaddeus Hyatt of New York engaged in concrete construction. In the early eighties E. L. Ransome gave concrete steel construction an impetus in this country by building a number of large structures from it. But the largest factor in the world-wide adoption of the armored concrete was Francois Hennebique of Paris, who erected and licensed other engineers to erect probably 10,000 different structures in all parts of the world, but mainly in France and Germany.

Fig. 1.—General View of What is Known as the Johnson Bar.

Fig. 2.—Twisted Bar Used in the Ransome System.

Fig. 3.—Section of the Thatcher Bar.

FORMS OF CONCRETE REINFORCEMENT.

The original method of utilizing steel to give tensile strength to the concrete structure was to use ordinary round, square or flat steel bars imbedded in concrete. The earliest application in America of steel reinforced concrete in a large way was in the construction of tanks for grain elevators, malt houses and similar purposes. From this field the use of the reinforced concrete has rapidly widened until to-day concrete engineering has become one of the important branches of technical effort, and concrete steel is admitted to competition with every other form of construction and material for almost every class of structure.

Very naturally the use of the plain steel rod suggested to engineers an improvement in the way of using a corrugated, roughened or otherwise deformed rod which should present larger surface of contact with the concrete and should form a mechanical bond with the concrete which should in a measure be independent of the first factor of cohesion. This idea has found its development in a large number of special forms of bars, rods or meshes, for each of which very positive claims are made by parties in interest. It is not the purpose of this article to enter into a discussion of the comparative merits of these several forms, but rather to briefly describe their characteristics.

Authorities differ as to the breadth of the field in which concrete construction can compete in price with timber. C. A. P. Turner of Minneapolis, member of the American Society of Mechanical Engineers, in a recent address delivered before the Minneapolis convention of engineers stated as his conclusions that for large buildings in which a working load of 500 pounds to the square foot or greater was to be met concrete steel construction could compete with timber on even terms; that for buildings where stresses greater than 800 pounds were encountered it was cheaper than timber and that for smaller buildings, where lighter than 500-pound loads were encountered, the concrete construction would compete with other forms of fire proof construction; in other words, that for large buildings with heavy loads concrete steel had a standing in court independent of its fire proof qualities and that for lighter structures its advantage lay in its resistance to fire rather than in its first cost. Mr. Mensch believes that, except where patented forms of steel are used, the concrete engineer can compete in first cost with timber for structures whose loads are as low as 200 pounds to the square foot and that the results would be more satisfactory and economical to the owner.

In general the armored concrete construction competes with timber and masonry more than it does with structural steel. Its advantage over masonry, aside from any saving in cost of construction, lies in the fact that the thinner walls permitted by it increase the interior floor space materially and decrease the weight and necessary footing for the structure. Its advantages over timber, as for instance in "mill construction," lie in its greater resistance to fire and the economy in space and materials accomplished by the thinner flooring and transverse members.

In comparison with the skeleton structural steel form of construction concrete steel is less injured by intense heats than the more exposed steel of the skeleton structure, as was illustrated in the Baltimore fire. For the same reason it is claimed to be more durable because the steel imbedded in the artificial stone is protected against corrosion due to moisture and other attacking agents. Greater durability than structural steel construction is also claimed because crystallization of steel and shearing of rivets due to vibrating stresses are avoided.

At the outset, in any discussion of the use of steel in connection with concrete, one encounters two schools whose dividing line may be said to be the carbon component of steel used. One school, following the leadership of Considere, the French authority, insists that the factor of tensile strength in a concrete steel structure can be figured no higher than the tensile strength of the steel itself after the steel is stressed to its elastic limit and that therefore the only means for securing the tensile as well as the compressive strength of concrete in connection with steel reinforcement is to use a high carbon steel whose elastic limit is very high. The other school, comprising makers of various systems of expanded metal fabric and soft steel bars of various forms, expresses a preference for the soft steel because its greater ductility will permit its manufacture into special forms for which advantages are claimed which could not be fabricated from high carbon steel. In this connection brief reference to special forms of steel is of interest.

The Johnson Bar.

As will be seen from an examination of Fig. 1 the Johnson bar, the manufacture of which is controlled by the St. Louis Expanded Metal Fire Proofing Company, St. Louis, Mo., is approximately square in section and of practically uniform area, the ribs not being waste, as in

earlier forms. This result is accomplished by rolling the bar on the diagonal and cutting in each roll ribs slightly wider than the spaces opposite which they come. The bar is made from high carbon steel with high tensile strength and elastic limit. The ribs on these bars have faces nearly at right angles to the axis of the bar, varying therefrom an amount not exceeding the angle of friction between concrete and metal, which condition is held to be essential in order that full efficiency of the reinforcement may be developed when the adhesion becomes weakened, which it has been shown may happen in many ways. It is further held as an advantage peculiar to this bar that cracks in the concrete cannot penetrate to the bar as long as the elastic limit in the latter is not exceeded. This bar is widely used in the construction of manufacturing buildings, railway bridges and other structures where heavy loads and vibration stresses are present.

The Ransome System.

This system is based on the use of a twisted bar, shown in Fig. 2, the bar being made of very high or very low carbon steel, as circumstances may determine. Recent experiments have shown that the twisting may be done cold even where a steel as high as 50 carbon is employed. The bar is twisted primarily in order to present a continuous mechanical bond rather than a bond that is effective only at intervals. Its makers, the Ransome Concrete Company, New York, states also that the twisting increases the elastic limit 50 per cent., while the ultimate strength shows an increase of 35 per cent. This bar is made in sizes varying by quarter inches from ¼ to 2 inch diameters, the safe tensile strength of the ½-inch size being given at 2½ tons, the 1-inch size 10 tons and the 2-inch size 40 tons. It is in very extensive use all over the country.

The Thacher Bar.

This bar, as will be seen from a study of Fig. 3, consists of an undulating beaded or bulbed bar, both the undulation and the beads serving as mechanical bonds with the concrete. The beads are placed at the smallest cross-section, reinforcing the bar at that point, making its sectional area and strength, according to the tests of the company, uniform at any point in the bar. Attention is called to the fact that all changes of sections are made by gradual curves, avoiding sharp corners, fins, knife edges and other sudden changes of form, as it is claimed that sharp corners are likely to cause cracks and are therefore not desirable. These bars, which are round rather than square in theoretical section, are furnished in from ¼ to 2 inch diameters. Originally ordinary round bars were run through special rolls that gave them the bulbed form, but the Concrete Steel Engineering Company, maker of the bars, has recently arranged to have them rolled special at a rolling mill.

The same company controls what is known as the Melan system, named after Professor Melan of Vienna, which is in a general way a concrete reinforcement of a structural steel building or bridge in such a way that resistance to compression stresses is aided by the concrete, greatly reducing the tonnage of steel required.

The Kahn Bar.

We show in Fig. 4 a general view and cross section of the Kahn bar. It will be seen that it consists of a square bar with projecting flanges sheared at intervals in such a way as to permit the wings or fins to be bent up at an angle of about 45 degrees from the base. These fins act as a half truss, the concrete itself in which the bar is embedded acting as the other half, forming a complete truss. The object of this particular form of bar is to produce a steel half truss which, when embedded in concrete, will relieve the concrete of all tension stresses. Thus a combination of the two is held to form a perfect and ideal structure both theoretically and practically. In other words, instead of using plain horizontal rods in connection with loose vertical stirrups, as is the general European practice to-day (Hennebique system), the two are combined in one bar. The Kahn system of reinforcement is controlled by the Trussed Concrete Steel Company, Detroit.

An advantage claimed for this bar over other forms of reinforcing steel is that diagonal or shear members are produced from that portion of the steel which is not necessary for direct tension and which in other forms of reinforcing steel is claimed to be wasted. In practice the maximum shear occurs at the ends of the beam and the majority of the shear members are placed there, and at the center the bar is left unsheared in order that the full section may resist the tension. When placed in beams or other structures these bars may be so combined by various sizes of diagonals, lengths, &c., as to form a perfect distribution of metal. The steel used in the manufacture of these bars is open hearth and varies in ultimate tensile strength from 60,000 to 70,000 pounds. With an ultimate elongation of 20 per cent. to 25 per cent. the elastic limit remains in the neighborhood of 35,000 pounds. The makers emphasize as one of the important advantages of the trussed bar their claim that satisfactory results may be obtained in this bar without the use of a high carbon steel, such as has been necessary with other systems of reinforcing material. The action of this bar, they say, is so different from plain horizontal reinforcement that high carbon is not necessary.

Fig. 4.—General View and Cross Section of the Kahn Bar.

Fig. 5.—The Trus-Con Bar.

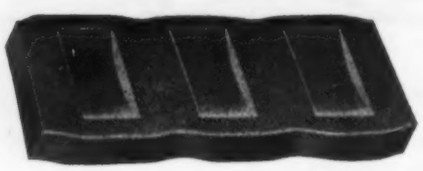


Fig. 6.—The Universal Bar.

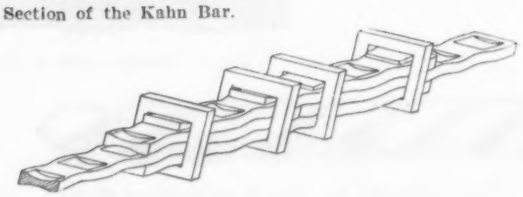


Fig. 7.—The Universal Splice.

Fig. 8.—The Mensch Corrugated Bar.

FORMS OF CONCRETE REINFORCEMENT.

The Trus-Con Bar.

The same firm makes and uses what it styles the Trus-Con bar, illustrated in Fig. 5. This bar is composed of an open hearth steel rod upon which is rigidly fastened at regular spaces round or square washers which are slipped on the bar cold. These are so fastened to the bar as not to reduce the section at that point. Approximately 10,000 tons of steel are used annually in these two systems.

The Universal Bar.

One of the latest forms of bar used in concrete reenforcement is the Universal, shown in Fig. 6. The cross section of this bar is that of an oblong rectangle and in this form lies one of its distinctive features, be-

cause of the large surface area exposed to the concrete. Adhesion is also greatly increased by recesses or pockets rolled into the bar at regular intervals which receive the concrete, guarding against slipping. The Universal bar is rolled from high carbon steel having an elastic limit of from 50,000 to 60,000 pounds per square inch on an 11-pass mill built specially for the work. Sections are rolled up to 60 and 65 feet long, where desired for the construction of long members. The same concern, the Rogers-Hall Company, Warren, Pa., also makes what is known as the Universal splice, shown in Fig. 7, which consists of the two bars to be connected, two splice bars of short lengths, four clamps, four wedges and a number of small elliptical forgings having the form of the pockets in the Universal bar. The ends of the bars are lapped over several recesses, the forgings are slipped into the recesses and the whole thing is clamped together with the square washers and small wedges which are driven between the washers and the bar. By means of this splice the steel re-enforcement can be made practically continuous for any length.

Mensch Corrugated Bar.

Another special form of bar is that shown in Fig. 8 and patented by L. J. Mensch of Chicago. This bar is round in section, with corrugations at intervals. It is made in sizes ranging from 7-16 to 1¼ inches in diameter, and its makers claim for it an elastic limit of 60,000 pounds and an ultimate strength of 100,000 pounds to the square inch. The same engineer also uses the Ransome twisted bar in situations where a deformed bar seems to be necessary, although as a general proposition he advocates the use of the plain bar because of the economy involved, and the bulk of his work is done with plain bars.

International System.

The international system of fire proofing consists of a steel wire fabric in combination with steel cable distributing members, both of which are manufactured from special drawn wire having high elastic limit as well as high tensile strength, though no specific claim is made of using a high carbon product. We illustrate a roll of the steel wire fabric in Fig 9. At each intersection of the mesh the wires are tied or locked by means of a steel disk or washer. In the construction the cables are anchored to the walls or beams and extend continuously to the opposite end of the building. The spacing of the cables is varied according to the desired carrying capacity of the floors, width of spans, &c. Over the cables the steel wire fabric is placed and all are embedded in the lower half of the concrete slab, thus providing continuous reinforcement throughout the entire floor.

The wire cables are formed on a special machine, by means of which they are twisted under hydraulic tension, thus producing an initial stress on the wires. Every wire is stretched tightly in place before the cable is twisted, producing a distributing member which is very stiff and rigid, with greater carrying power, it is claimed, than rods or bars. Ordinary cables are held to be not suitable as distributing members, since they never cease to elongate. The steel wire fabric is made in six different gauges and meshes and is shipped in rolls of any desired length. The manufacturer states that the great majority of the work is done with what is termed the A1 grade, composed of No. 9 gauge carrying wires, more than twelve million square feet of this one grade now being in use in this country.

For columns, girders and beams of reinforced concrete the owner of this system, the International Fence & Fire Proofing Company, Columbus, Ohio, recommends the use of round steel rods, which it claims if used intelligently will produce the same results obtained by any of the various deformed rods, bars or sheared members.

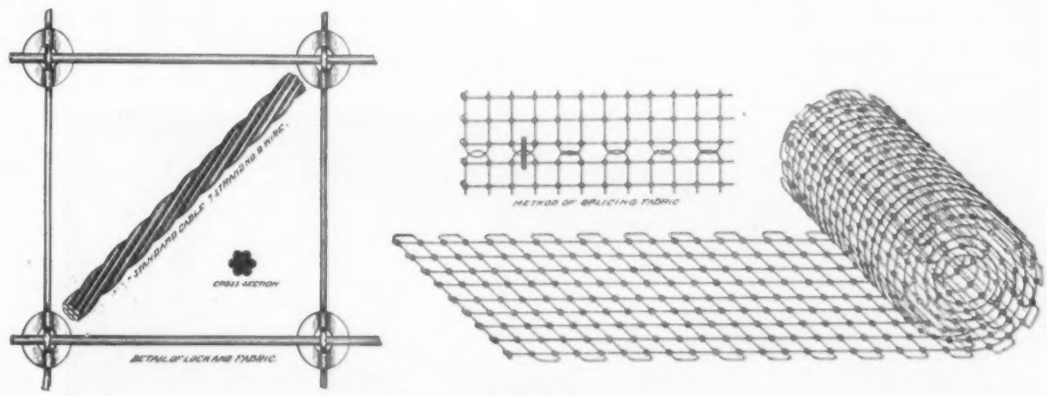


Fig. 9.—Details of the International System.

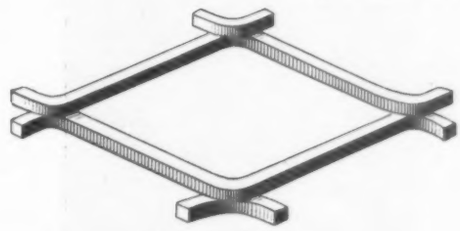


Fig. 10.—A Typical Form of Expanded Metal.

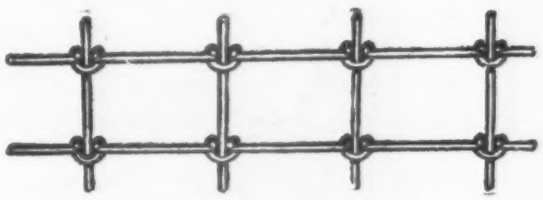


Fig. 11.—Reinforcing Wire Fabric.

FORMS OF CONCRETE REINFORCEMENT.

Expanded Metal System.

The Associated Expanded Metal Companies, with headquarters in New York and branches in a dozen cities in the United States and Canada, controls largely the use of expanded metal for concrete reinforcement, as well as a substitute for the ordinary lath. This expanded metal is fabricated by special machinery, which slits a sheet of steel and expands the openings into diamond or other shapes. Sheets are used as heavy as ¼ inch and as light as 27 gauge, the size of opening varying from 6 inches long to ⅜ inch. The largest application of expanded metal is used as a substitute for lath in walls and partitions and a substitute for timber in flooring, although it is also used for vertical members in connection with I-beams, box girders, channel girders and the like. Sheets of expanded metal are furnished in widths of from 12 to 72 inches, the usual length being 8 feet. Expanded metal in connection with concrete is also widely used in the construction of dams, conduits, sewers, tanks, coal pockets, bridges, docks and in general where brick would otherwise be used. Expanded metal manufacturers are now among the largest consumers of sheet and plate steel, as they use annually many thousands of tons of this material. In a building in which expanded metal is employed to the maximum the tonnage of steel is almost as great as

in the older form of steel column and girder construction, while lumber and brick are almost entirely displaced. A typical form of expanded metal is illustrated in Fig. 10.

Reinforcing Wire Fabric.

One of the more recent systems, which has profited by the extensive experimentation of earlier methods, is the reinforcing wire fabric being marketed by the American Wire Fence Company, Chicago. This mesh, as will be seen from a study of Fig. 11, consists of straight longitudinal wires crossed by straight transverse wires, the bond or tie between the two being a special staple or tie which is forced onto the joint by heavy pressure, sufficient to make the bond permanent and yet not enough to break the fiber or destroy the tensile strength of either the longitudinal or transverse wires. This construction has the advantage of presenting the minimum factor of elongation of both the longitudinal and transverse wires, as both are practically straight wires, uninterrupted by kinks or distortions, and both are made of high carbon steel of very high tensile strength and elastic limit, these factors being claimed to be fully double those obtained on bars, or even on the ordinary soft wire. This use of high carbon spring steel not only tends to reduce the cost of the reinforcement, because of the lighter tonnage required, but every pound of weight saved relieves the structure of the burden stress of its own weight. The fabric is furnished in lengths of 300 or more feet, with a standard width of 50 inches. A special device is also provided for joining widths together so as to make practically a continuous fabric both as to width and length.

Wire Reinforcement and Lath.

Many other forms of steel mesh are used as a substitute for lath and as a reinforcement for floor slabs, columns and girders. Most of the wire mills of the country have large customers who either buy the wire and weave it into special mesh for the purpose or have it shipped to them in the finished form. The tonnage of wire that finds its way into building operations in connection with plaster and concrete is very large and is rapidly increasing.

There are doubtless many other special forms of steel used in connection with concrete, but what we have given will suffice to illustrate the activity being exerted in that direction.

Monier System.

This system is the pioneer of all armored concrete systems. It consists in the use of steel bars, usually round, embedded in concrete in such a way as to resist both vertical and lateral tensional stresses. It has been used with success in erecting some of the largest grain elevators in the country, as well as in bridges, storage tanks and buildings. No attempt is made to increase the adhesion of the concrete by means of deforming the bar, as it is held that the natural adhesion is sufficient for all probable stresses.

Hennebique System.

This system consists in the use usually of plain round bars parallel with the lower face of the beam and separate bent rods or stirrups placed over them in a vertical plane, the horizontal rods furnishing the tension members, the bent vertical stirrups resisting the shearing stresses, while the concrete forms the compression members. The bars are usually split at the ends, and concrete tamped into the Y-shaped opening serves as an anchor that offers great resistance to tensional stresses. Thousands of large structures in Europe and hundreds in this country are constructed on this system.

The Turner System.

A system of column reinforcement consisting of grills formed of rods banded at intervals by strong riveted hoops, with one of the rods bent outward into each beam connected to and supported by the column, has been evolved by C. A. P. Turner, an engineer of Minneapolis, Minn. The whole grill he wraps with ordinary wire netting. In buildings carrying moderate loads no beams are used, but merely floor slabs running from column to column or from column to wall. The reinforcement of the slab is directly from column to column and transversely from column to wall. The vertical bars of each column are bent normally to the column in the slab flooring, forming a cap supporting the slab reinforcement. The accompanying half-tone reproduction from a photograph, Fig. 12, illustrates the method of inclosing the grills for beams and girders in forms or boxes, into which the concrete is poured in a semiliquid form. Several grills are shown on the floor in the foreground. He uses on an average 2000 tons of steel a year in his system. He also uses a special high carbon wire fabric for reinforcing floors of long spans.

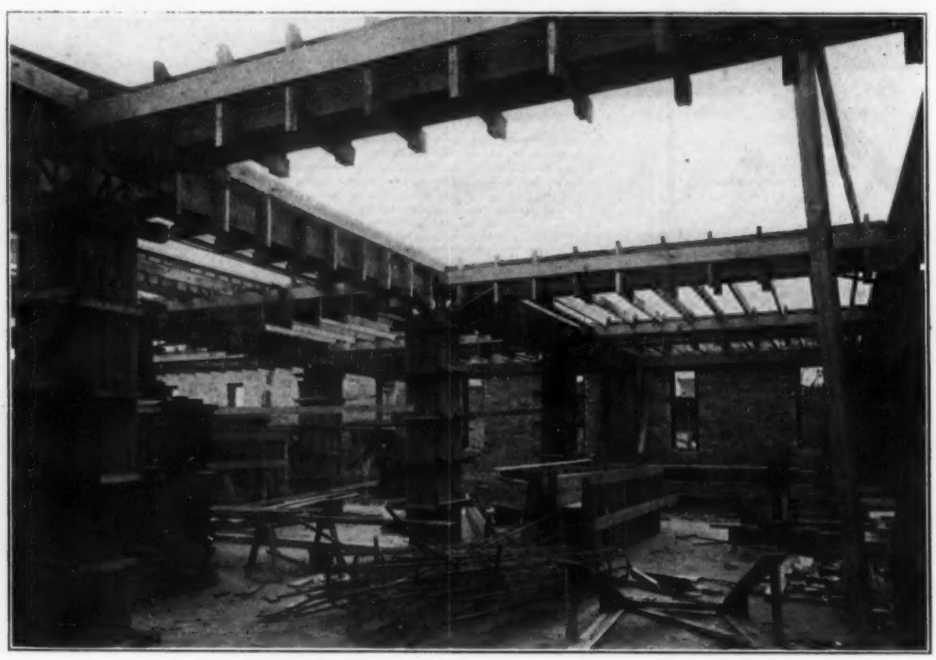


Fig. 12.—View Showing Forms for Inclosing Grills for Beams, Girders, &c.

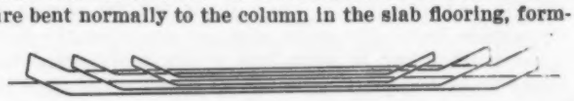


Fig. 13.—Another Design of Reinforcement for Beams, &c.

The Cummings System.

Another system for columns, struts, piles, and girders and beams, the standard design of which is shown in Fig. 13, is the invention of Robert A. Cummings, Pittsburgh, Pa. In reinforcing the columns self-centering circular bands are held in horizontal position at close intervals

one above the other by attaching to vertical flat rods or shapes. The structural function of the bands is to prevent the failure of the concrete by lateral swelling, and that of the vertical members to prevent bending of the columns by eccentric loading, thus producing what is claimed to be a rational combination for columns, struts or piles. In distributing the steel in beams or girders the portion of the rods not needed for bending stresses near the supports are made into rectangular frames and bent up at their ends. These rods form anchored loops to resist tensional shearing stresses and being connected become self-supporting, thus obviating the difficulty in holding single bent up rods when placing the concrete. All the remaining rods are straight.

The steel rods range in diameter from ⅜ inch to 1¼ inches. Finished rolled bars rather than wire rods are used in the Cummings system. This system has the advantage of using only commercial shapes instead of requiring special forms of steel.

Steel Slag Cement.

Fortunately for this new industry cement making interests are keeping pace with the increased demand for their product. The output of Portland cement for 1904 was about 23,000,000 barrels, and this has been augmented so that the 1905 output will be over 25,000,000 barrels. The Illinois Steel Company, at Chicago, has erected at Buffington, Ind., near Chicago, a plant for making true Portland cement from blast furnace slag. This new plant has a capacity of producing 4500 barrels a day, or approximately 1,350,000 barrels a year. This is understood to be the only steel plant in the country that is thus far making true Portland cement from blast furnace slag, though for some years furnaces have been making a form of non-Portland cement that was admirable for foundations, abutments or piers, where moisture was always present and air excluded.

What Is a Manufacturing Cost?

BY C. CARINGTON.

From time to time articles are written on the question of cost of manufacture. Systems varying in detail are exhibited, but all have one result in view, viz., ascertainment of the actual cost of manufactured articles. Cost of manufacture is an elastic term. Sometimes it signifies mere factory cost; at other times it includes items other than actual factory figures, and still again and rarely the absolute and final cost of the manufactured article ready to be delivered to the buyer. Few costs are made up which show this absolute and final value of the manufactured article, and experience has shown that even some of these are far from satisfactory. Every pertinent expense must be included or the result will be misleading and therefore worthless. Take for instance a corporation manufacturing such a staple and universal commodity as steel. This corporation mines its own coal and operates its coke ovens and blast furnaces by means of subsidiary or affiliated interests. These interests should show a profit in order to pay bond interest, purchase money obligations, to provide for sinking fund requirements, &c., and the question arises how to apportion the profits. Is it to be done by adding to the costs of the subsidiary interests' output some agreed percentage, the ultimate distributing corporation paying this profit and reducing its own? Or shall it be accomplished by charging the parent company with the actual cost of such materials in process of manufacture as are necessary to produce the finished article, and letting the parent company distribute the profits on a ratio of capitalization, or business done, as the case may be? Naturally the unified concern wishes to show that its affiliations are being operated at a profit; therefore a certain percentage is added to the cost and material in process of manufacture is bought or transferred at the value thus enhanced.

The fault with this system is that it suggests a field for manipulation, whereas if the total profits are shown by the distributing corporation the accounting is simplified and strengthened. Its only justification is expediency for purposes of comparison with the market value of any article necessary to manufacture the finished product, and to show that such article is being produced at a reasonable figure, even with an added profit.

Figuring Profits of Consolidated Companies.

Some time since the announcement was made that the leading steel interest had introduced a change in bookkeeping, whereby the profits on the products of subsidiary companies were no longer reported as the material was transferred from one plant to another, and that no profits would be recorded until the finished material had been delivered to the customer. In the writer's opinion and experience this is the only correct method. A cost to be worth anything must include all expenses, for unless it is complete how can it be ascertained except when the balance is struck at the end of a fiscal period whether a profit is being made or a loss incurred? It will be asked why a manufacturing cost should include items such as depreciation, interest and administration expense, and if it should, how can they be intelligently and equitably apportioned? In partial answer to this question the following condensed plan is outlined:

Charge up all component parts of a manufactured article at their actual cost and then add to this an amount sufficient to cover all expenses outside of purely manufacturing cost and the absolute cost of the manufactured article is thus arrived at.

The concluding part of the above indicates the role in which the expert cost accountant will make himself felt. The result is attained by a fair and unflinching review of the past, recognizing dull as well as busy periods and thus arriving at an honest average. In slack times plant renewals and repairs will show up heavily in the associated general expense, while in prosperous periods such expenses are almost invisibly absorbed; but by taking into account the past, including good and indifferent seasons, a fair ratio of the expense to be charged into the actual cost of manufacture can be ascertained and correctly included. If this be not done and if such charge be not incorporated in the price to the purchaser then the manufacturing concern will show a balance on the wrong side of the ledger at some time, although by cowardly accounting the evil day be long postponed. Revaluation of a plant may precipitate the result and the end will be little short of disastrous.

A Faulty Method.

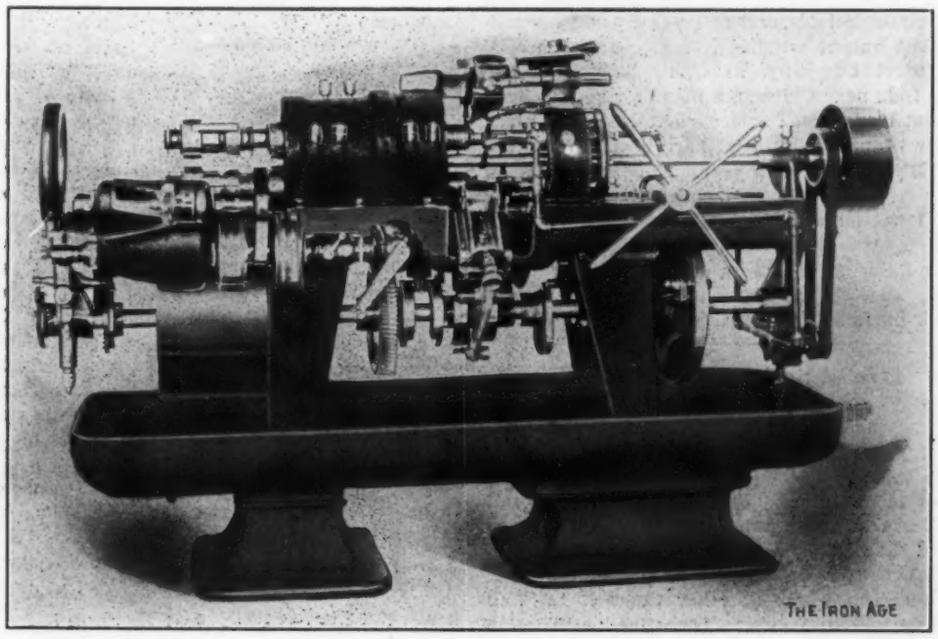
It has been the experience of the writer to have dealt with manufacturing costs in various phases. As an instance: When a large manufacturing concern takes its mere shop cost as a basis for its selling price, and charges into an account called "Items Proportionable" all expenses other than this actual shop cost, it is past comprehension how the actual cost of the product is arrived at. If the current expenses are abnormally heavy, for during times of idleness or reduced working hours they certainly will be, we have still the fair ratio for a guide as referred to above. If the articles manufactured are other than those sold by weight, the ratio charged should be ad valorem. If the product is sold by weight the tonnage is the factor to which the pro rata should be charged.

The ideal system of accounting as related to manufacturing costs is one that is fearless, honest and consequently able and willing to face all items of expense. Elusive suspense accounts and entries that should be taken care of in cost accounts, but are not, do not reduce the cost, but merely evade the issue. If steel or iron costs so much per ton, then let the statement of that cost include every expense item in order to ascertain what profit per ton is actually made on material delivered to the purchaser. I maintain that this is the only fair method of showing an actual manufacturing cost.

The steamer B. F. Jones, built for the Jones & Laughlin Steel Company, Pittsburgh, was launched on Saturday afternoon, December 30, at the shipyard of the Great Lakes Enginering Works, Ecorse, Mich., below Detroit.

The Simplex Four-Spindle Automatic Screw Machine.

The greater producing capacity of the multiple spindle type of automatic screw machine over the single type machine seems to be appreciated on the other side of the Atlantic as well as in this country. The illustration shows a four-spindle automatic screw machine of English make, this being one manufactured by the Acme Lathe & Products Company, Limited, Trafford Park, Manchester. One of its important advantages is the ease of setting and the facility in the changing from one job to another. It is described as having no complicated parts and having all parts plainly in view and easily accessible. No cams are required to alter the length of travel of the tool slide, as this is done by an oscillating disk which can be set in a few minutes to any desired throw within the limits of the machine. Eight changes of feed can be obtained through a train of gears within a gear box. By means of an arrangement on the top of the tool slide the automatic travel can be thrown out of gear and the tool slide worked backward and forward by a hand wheel, thus greatly facilitating the setting of the tools. This feature is also useful when tools have to be taken out to be sharpened.



The Simplex Four-Spindle Screw Machine Built by the Acme Lathe & Products Company, Limited, Manchester, England.

The pan is mounted on pedestal legs, the one on the right being used as an oil reservoir. The bed proper is a continuous casting strongly webbed and is mounted on legs which stand in the pan and are bolted to it. The feeding and chucking mechanism is mounted within the bed itself and is actuated by cams on a drum on the cam shaft. These cams are never changed, as the length of feed may be changed by a screw and slide. The machine will handle bar stock up to ⅞ inch in diameter.

All noncutting motions of the machine, such as revolving the cylinder, withdrawing the tool slide, &c., are performed at an accelerated speed. The screw cutting arrangement on this machine is also quite a new feature. No stop spindle is necessary as in other types of four-spindle machines. At the completion of the thread the spindle carrying the die or tap is stopped, instead of the work spindle. By a special arrangement the die or tap can be withdrawn from the work while the tool slide is still advancing, so that when the tool slide is withdrawn no slow movement is necessary for the unscrewing of the tap or die; consequently this withdrawing movement can always take place at a high rate of speed.

The method of revolving the cylinder is also important. This movement is effected by a free worm wheel which revolves round the cylinder one complete revolution to one turn of the cam shaft. This free wheel has a steel lined keyway cut in it, which at the required moment engages with a steel key sliding in a groove on the cylinder. This key, by an arrangement of withdrawing cams, is allowed to engage for one-quarter of a revolution only, so that the cylinder carrying the four work spindles is carried round one-quarter of a turn, the key being then withdrawn. At this moment a conical steel plunger is forced into the cylinder to accurately index it and then the tool slide is advanced to perform another cycle of operations. By this means of revolving the cylinder a heavy load of bars can be carried round with great ease and there is no risk of broken teeth.

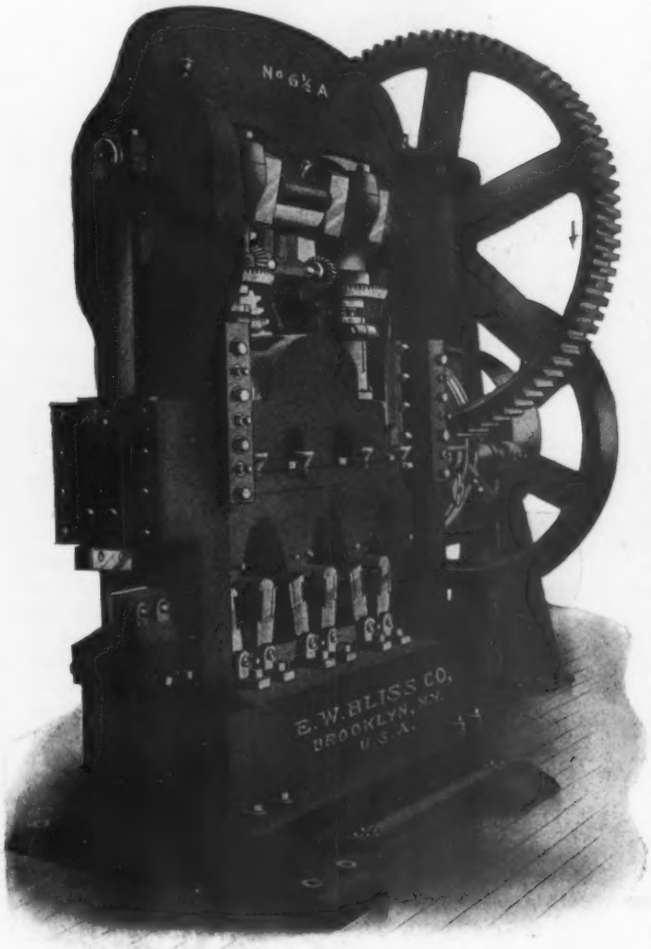
International Agreements on Rails and Nails.

The Liége, Belgium, correspondent of the London *Iron and Coal Trades Review* refers to the report from Madrid that the Altos Hornos de Viscaya Company of Bilbao had become a member of the International Rail Syndicate and had received an allotment of 28,000 tons a year. The correspondent asks: "Who has agreed to a reduction to this extent to allow of the inclusion of the Spanish company?" Concerning a proposed international agreement on nails, the same correspondent says that it is understood this was concluded at a conference at Paris in December. It is stated that American works were included in the scope of the agreement as well as those of England, Germany, France, Belgium, Italy and Austria; also that the export price was fixed at 8s. 4d. per cwt. for European and Asiatic Turkey and 8s. 1½d. for Egypt, while the Belgian price for export to England is 7s. 4d. per cwt.

Another statement concerning the international agreement in nails is that the advance in prices to the Orient decided upon is 12s. a ton and to Egypt and Bulgaria 8s. a ton. The representatives of the Belgian Wire Nail Syndicate proposed that all export orders in the markets of the world should be apportioned among the individual groups on the basis of the average deliveries for the export trade in the past three years, and it is stated that this principle was indorsed, though its carrying out is a matter for future consideration. The question of an arrangement between the Belgian and French works was left to the two groups for adjustment. It is understood that the actual establishment of an international agreement depends on the outcome of the proposal for a general wire nail syndicate in Germany.

A Bliss Double Crank Forging Press.

A special double crank forging press which is used in the manufacture of hammers, axes, pickaxes, adzes, mattocks, hoes, &c., is illustrated as made by the E. W. Bliss Company, 11 Adams street, Brooklyn, N. Y. The press contains several dies set side by side and the article is forged in one or several heats by passing it from die to die. The slide can be quickly and accurately raised and lowered by means of an adjustment which is arranged to operate both crank connections simultaneously. The machine is provided with three forged steel die carriers having automatic side action so as to hold and shape the stock on the outside while the eye is being prepared or punched. An improved automatic friction clutch is used on the press, which permits of giving a blow instantly as soon as the metal to be forged is in position. After delivering its blow the slide always stops



A Special Double Crank Forging Press Built by the E. W. Bliss Company, Brooklyn, N. Y.

at the highest point of its stroke, leaving the dies wide open for another operation.

With this machine from 1000 to 2000 iron pick or hatchet eyes may be forged per day, or from 500 to 1000 steel pick eyes, according to the size and style of eye and diligence of the operator. The average iron pick eye is shaped and punched in two strokes, a solid tool steel pick eye in three or four strokes and a hatchet eye in two or three strokes. In most cases it is necessary of course to leave more or less flash or fin, which must be removed after the forging. The shear attached to the outside of the left housing is used for cutting off the stock after or before the forging. The machine is so arranged that the dies and punches may be cheaply made and easily exchanged without any special skill or adjustment.

The Halcomb Steel Company.

The Halcomb Steel Company, Syracuse, N. Y., announces to steel consumers and the trade that its works, which have been under construction for some time, are now nearing completion and will very shortly be ready to operate. Tapped by the lines of three trunk railroad systems and within a short haul of important ports on the Great Lakes, while but a few hours' ride from the anthracite coal fields of eastern Pennsylvania, the location is ideal for a plant of this kind, not only for economy of operation but also for convenience in handling supplies and marketing products.

The works include complete crucible and open hearth melting departments so arranged as to use, with slight changes, either producer gas or fuel oil. Coke and bituminous and anthracite coal are within easy reach; thus the plant is entirely independent as to fuel supply. A forging department, bar and sheet rolling mills and a complete cold drawing department are parts of the installation. The last named produces high grade polished rods and all shapes and sizes of bars and wire from the smallest size, suited to the watch hair spring, up to 3 inches round and square and all exact to size.

Independent motors, electric and hydraulic jib and traveling cranes, reheating and annealing furnaces, an annealing, cleaning and wire tempering department and all accessories are provided, affording every facility for expeditiously turning out perfect material. The finest qualities of steel will be the specialty. High speed steel and tool steels will be the principal product.

The business of the company is under the personal management and direction of C. H. Halcomb, the president. R. H. Bulley is the superintendent, and a full and competent force of steel makers and workers, skilled in every department, has been secured. Mr. Halcomb was president and general manager of the Sanderson Bros. Steel Company, Syracuse, N. Y., from 1883 until the sale of the business in 1900 to the Crucible Steel Company of America, when he became first president of the purchasing company, from which position he retired in 1902, and it was he who brought the Sanderson works to a high state of efficiency and the product to a world wide repute. Mr. Bulley was for many years general manager and superintendent of the Canton Steel Company's works at Canton, Ohio, where under his skillful management steel was produced of such excellent qualities and uniformity of tempers as to command large sales in all districts where known. The Board of Directors is composed of the following: L. C. Smith, president L. C. Smith & Bros. Typewriter Company and president National Bank of Syracuse; F. R. Hazard, president Solvay Process Company and president Syracuse Trust Company; F. B. Scott, president Syracuse Supply Company; H. S. Wilkinson, capitalist, and C. H. Halcomb.

Arrangements for depots in a number of the principal cities have been completed, particulars of which will be announced in due time. A catalogue is under preparation.

The annual meeting of the Bessemer Pig Iron Association was held in Cleveland, Ohio, December 23, and the association was renewed until January 1, 1907. An executive committee was elected, consisting of Samuel Mather, L. C. Hanna, Harvey H. Brown, Edward L. Ford, Robert Bentley, Frank Hitchcock and Joseph G. Butler, Jr. Mr. Butler was re-elected president and Samuel Mather treasurer. The association controls the output of about 17 blast furnaces in the Mahoning and Shenango valleys.

The Ingersoll-Rand Company announces that it has secured exclusive control of the product of the Imperial Pneumatic Tool Company, with shops at Athens, Pa. The line of Imperial tools is well-known and complete, including pneumatic hammers, drills, riveters, reamers, hoists and plug drills. The Ingersoll-Rand Company is manufacturer also of the Haeseler pneumatic tools and the public is now offered its choice of these two distinct lines of tools of established merit.

A New Sprague Electric Motor.

A new line of direct current motors known as type D has recently been put on the market by the Sprague Electric Company, New York. The motors range in size from 10 to 105 horse-power and are made in entirely inclosed, semi-inclosed and open form. The sizes from 10 to 20 horse-power are bipolar and those above multipolar. The motors conform to the most approved practice in respect to the ventilation of the windings, overload capacity, high efficiency, durability, compactness and variable speed. They are built with shunt, series or compound field windings for use on 115, 230 or 500 volt direct current circuits.

The yoke is of cast steel in all but the three largest sizes, which have cast iron frames. The poles are of laminated sheet steel and are securely bolted to machined surfaces inside the frame. The construction is such that it is possible to remove a pole with its coil without disturbing the armature or other poles, as may be seen from Fig. 1. The field coils are interchangeable. The armature cores are built up of thin notched punchings of annealed and japanned sheet steel. These in motors having four poles are keyed directly upon the shaft, and on the larger motors having six poles are keyed to cast iron spiders and the spiders keyed to the shaft. Openings are left in the core, both radially and parallel to the shaft, permitting a circulation of air to keep the parts cool. Fig. 2 shows a typical armature.

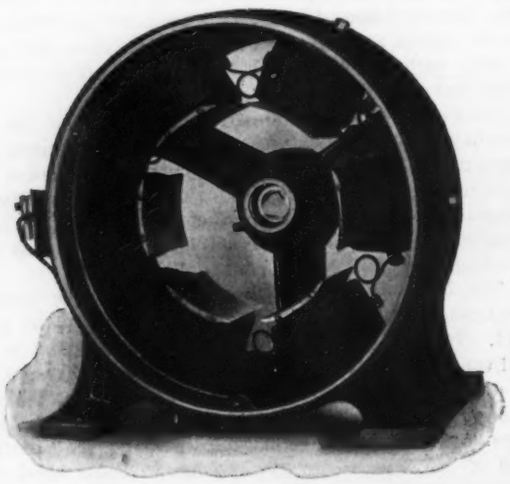


Fig. 1.—A Type D Six-Pole Sprague Motor with Armature Removed.

Fig. 2.—Armature of a Type D Motor.

The brush holders are of the box type, in which the carbon slides in a metal pocket and is pressed against the surface of the commutator by a flat adjustable spiral spring. Flexible copper leads connect the brush holders and brushes, so that sliding contacts or tension springs are not depended on for carrying current. The cast iron rocker arm, which carries the studs upon which the brush holders are mounted, is attached on the inside of the front bearing bracket. The brush holders are adjustable along these studs parallel to the shaft. The bearings are ring oiling, with sight holes, covers, oil gauges and drain plugs attached to the oil reservoirs.

The subbases are arranged with cast iron drip pans directly beneath the motor bearings, making it unnecessary to place a separate pan under the motor to catch oil drippings.

Concerning the operation of the motors it is stated that the standard open motor will run continuously at full load and rated voltage with a temperature rise not exceeding 40 degrees C. in any part. In the semi-inclosed motors, such as shown in Fig. 3, the rise in temperature will not exceed 45 degrees. The standard open and semi-inclosed motors will operate without injurious heating or sparking at 25 per cent. overload for two hours and 50 per cent. overload momentarily. It is unnecessary to shift the brushes to prevent sparking when varying the load from no load to full load. The inclosed motors, Fig. 4, will operate continuously at full load and rated voltage with a temperature rise not exceeding 60 degrees C. With the brushes in their fixed position there will be no injurious heating or sparking from no load to 25 per cent. overload and a 50 per cent. momentary overload will be stood without injury.

Fig. 3.—Semi-Inclosed Six-Pole Motor.

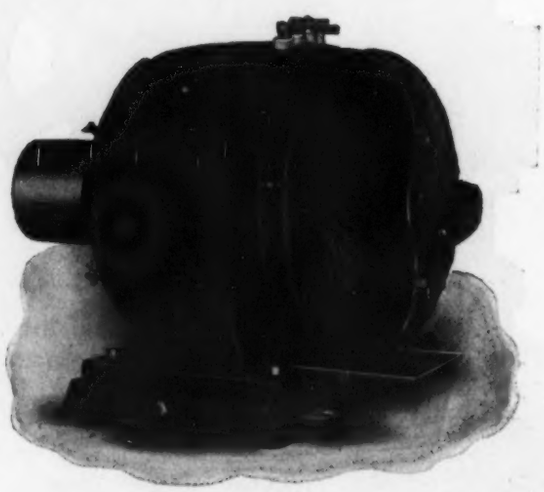


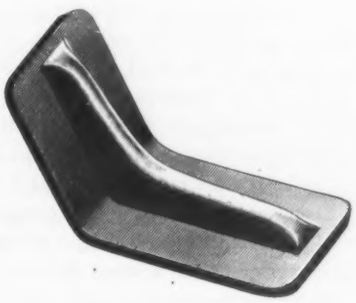
Fig. 4.—Fully Inclosed Four-Pole Type D Motor.

In a review of the coal trade of 1905 in the New York *Globe*, Frederick E. Saward makes a striking statement to show the extent of the coal output of this country, which in 1904 reached 352,000,000 net tons. He cited the fact that the total amount of freight moved by American railroads in 1904, after making allowance for freight that traveled by two or more roads, is estimated at 700,000,000 tons. The coal mined thus equals in weight one-half the total freight carried in the United States, though not constituting one-half of it, as much coal is conveyed by water.

The New York *Herald* has entered the field as an advocate of the adoption of the metric system.

The Scully Pressed Steel Boiler Lug.

The peculiar advantage of the boiler lug illustrated is the added stiffness and strength obtained through the strong center rib. The lug is one that has recently been placed on the market by the Scully Steel & Iron Company, Chicago, Ill., and in general dimensions is approximately the same as others of a similar type. It is made of open hearth flange steel of 60,000 pounds tensile strength and is formed on a hydraulic press. A test is cited of an experiment recently conducted by R. W. Hunt & Co., Chicago, in which two standard 48-inch Scully lugs were bolted to a cast iron block and supported on 25¼-inch centers. Pressure was applied and the lug stood a maximum load of 64,780 pounds. The lugs were bent but showed no fractures. Two ordinary pressed steel lugs were then tested in the same manner and sustained a maximum load of only 33,470 pounds, the webs



The Scully Pressed Steel Boiler Lug.

being ruptured at this point. The Scully lug is made in both the standard and the special eastern types and has no side flanges, contributing to ease in riveting and handling.

The Philadelphia Foundrymen's Association.

The fifteenth annual meeting of the Philadelphia Foundrymen's Association was held at the Manufacturer's Club in that city Wednesday evening, January 3. Dr. Elmer E. Brown occupied the chair.

The annual report of the treasurer showed the association to be on a sound financial basis. With all indebtedness paid there was in the treasurer's hands a balance of over $1900.

The Floyd-Wells Company, stove manufacturer, Royersford, Pa., represented by George W. Wagoner and W. A. Pollock-Davis, of Philadelphia, was elected to membership.

The annual election resulted in the unanimous choice of the following officers for the coming year:

President, Thomas Devlin of Thomas Devlin Mfg. Company, Philadelphia; vice-president, Alex. E. Outerbridge, Jr. of Wm. Sellers & Co., Incorporated, Philadelphia; treasurer, Josiah Thompson of J. Thompson & Co., Philadelphia; secretary, Howard Evans of J. W. Paxson & Co., Philadelphia. Executive Committee: H. O. Evans of Thomas Devlin Mfg. Company; Thomas M. Eynon of Eynon-Evans Mfg. Company; E. E. Brown of E. E. Brown & Co.; George C. Davis, chemist, all of Philadelphia, and R. C. Oliphant of Trenton Malleable Iron Company, Trenton, N. J. Trustees: Thomas Devlin, president; Josiah Thompson, treasurer, and Howard Evans, secretary.

President Devlin presented a brief review of the association's work, which was read by Howard Evans. The first meeting of the association, he said, was held at the Manufacturers' Club, Philadelphia, July 29, 1891, after a general call sent to all foundrymen within a radius of 100 miles of the city. On September 2 of the same year the organization of the association was completed, the first officers being Francis Schuman, president; Thomas Devlin, vice-president; Howard Evans, secretary, and Josiah Thompson, treasurer, and 10 members being the entire enrollment at that time. The membership grew rapidly and early in 1892 reached a total of 63. The first executive committee of the association was made up of Col. W. H. Harrison, Walter Wood, G. P. Smyser, L. B. Whitney and Thomas Glover, with the president and secretary as ex-officio members. In December, 1892, representatives from all the steel casting plants in the United States attended a meeting called under the auspices of the association. As the result of this meeting an agreement was made which finally led up to the formation of the American Steel Foundries, now an important factor in the steel casting trade. Later, also under the auspices of the Philadelphia Foundrymen's Association, the Sash Weight Association and the Cast Iron Soil Pipe Association were formed.

In May, 1896, the first national convention of foundrymen ever held in this country was arranged for by this association. A three-day session, May 12, 13 and 14, was held, and as a result of this the American Foundrymen's Association and later the National Founders' Association were formed.

At the fifth annual meeting in 1897, P. D. Wanner, Reading, Pa., was elected president of the association, Mr. Schuman having succeeded himself as president until that time, Thomas Devlin being re-elected vice-president. In 1898 Mr. Wanner succeeded himself as president and Antonio C. Pessano was elected vice-president. In 1899 Thomas I. Rankin was elected president and James D. Stirling vice-president, and these officers succeeded themselves yearly until 1902, when Thomas Devlin was elected president, and has since that time held the office and was re-elected again for the coming year.

Alexander E. Outerbridge, Jr., succeeded Mr. Stirling as vice-president in 1903 and has been successively re-elected to that office. Howard Evans, secretary, and Josiah Thompson, treasurer, have served in their respective offices since the formation of the association.

The Philadelphia Foundrymen's Association was largely instrumental in having established at the St. Louis World's Fair in 1904 a working foundry exhibit. It has held a number of meetings of particular interest, one of the recent ones being the vaudeville dinner, in honor of a joint meeting of the Pittsburgh, New England and Philadelphia Foundrymen's Associations. The latest association formed under the auspices of this association was that of the Associated Foundry Foremen of Philadelphia and vicinity, which is now in a flourishing condition.

The association was incorporated June 2, 1902, under the laws of Pennsylvania, and promises even a more successful career in the future than its records show of the past. Many important papers on technical and kindred subjects, prepared by many of the leading authorities in their respective fields, have been read and discussed before the association, it being the policy of the association to have such papers and an open discussion of them at each of its regular meetings. The present membership now exceeds 100 and additions to the list are constantly being made.

The paper before the association for the evening was entitled "Permanent Molds and Carbon Cores," by Henry C. Caldwell of Buffalo, N. Y. In Mr. Caldwell's absence the paper was read by J. W. Daniels.

Rev. Wm. J. H. Boetcker of the Mental Antidote Society, Shelbyville, Ind., addressed the association on "The Right and the Wrong Sides Between Employers and Employees," which was particularly interesting. Mr. Boetcker is an enthusiastic volunteer worker in the labor field, actively endeavoring to counteract the influence of professional agitators. A vote of thanks was tendered the speakers of the evening, after which the meeting adjourned.

The Westinghouse Electric & Mfg. Company is finding an extensive field for its motor equipments in the marble finishing industry. A large marble yard in the South recently equipped with electric drive shows a marked increase in the product and a decrease in the operating cost. The electrification of the plant has further eliminated the many objectionable features of belting and shafting, which were much in evidence under the old conditions.

THE IRON AGE

1855—1906.

New York, Thursday, January 11, 1906.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHER
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A. I. FINDLEY, - - - - - - - - - } EDITORS
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR

The Iron Age Index.

The index to the reading matter of Volume 76 of *The Iron Age*, for July 1 to December 31, 1905, has been compiled and printed, and will be mailed to those subscribers of *The Iron Age* who will make application for it.

To relieve those who bind or file *The Iron Age* of the trouble of future applications for the semiannual index we have a special list of addresses to which the index is forwarded without further notice. Subscribers who desire their addresses entered upon that list will kindly so advise us.

The Development of Vessel Building on the Lakes.

The lake shipyards are like car and locomotive works in that their condition has alternated in surprisingly short swings from empty to full order books. But the business of the shipbuilding interests on the lakes differs from that of the railroad equipment companies in this particular—that whether it be prosperous or depressed there is always somewhere a disposition to question whether the supply of vessels is not much beyond the requirements of traffic, or sure to be when the boats under construction or contracted for get into commission. It may be that the months of inactivity that follow every season of navigation and the tendency in this hibernation period to accentuate the ominous in the outlook account in large measure for this lurking pessimism. In any event, since the years preceding the nineties, when wild chartering was more common and when rates soared at the end of every season, there has scarcely been a time when predictions have not been heard of serious overcrowding of the vessel business of the Great Lakes.

In the past year, which has a record of 28 freight steamers launched from lake yards, it has been said again that tonnage was being added more rapidly than the requirements of the traffic demanded. At times the view has seemed justified by existing conditions and by the history of the lake trade. And yet for delivery this year the books of the shipyards contain orders for 34 heavy freighters, capable of carrying 7,000,000 to 7,500,000 tons of ore in a season. The additions of 1905 represent a season's carrying capacity of 5,500,000 to 6,000,000 tons, so that for the two years the tonnage additions would mean 13,000,000 tons of ore in a full season. The expansion seems rapid, and yet when it is considered that ore consumers who own their own mines will own a large part of the new tonnage, it can be appreciated that the measure has been well taken of the requirements of the future.

The disastrous storms of 1905 removed an unusually large amount of tonnage from the lakes. With all allowance for the fact that some of this was obsolete and that a part of the remainder was not available for the ore trade because not of the size to be operated economically in that trade, there was still a heavy loss to ore transportation that must be made up. But the replacement of wrecked vessels is only an incident of the movement that is now making unprecedented demands upon the shipbuilders. The enormous increase in ore shipments has already been so much commented on that no statement of the probabilities in that direction now excites surprise. There will be reactions, as there have always been, from iron ore records, pig iron records and steel records; but it is well assured that for 1906 the lake ore shipments will be above 37,000,000 tons and may reach 38,000,000 tons. Further, the average for the five years ending with 1910 may readily be 40,000,000 tons, allowing for the probabilities of reactions, as against an average of 25,000,000 tons in the five years preceding 1906. Here alone is a demand for 15,000,000 tons a season of vessel capacity in excess of the supply of the past five years.

A phase of this subject that probably has not had the consideration it deserves is the movement in the vessel trade similar to that in railroad construction. A large percentage of the railroad consumption of steel in recent years, as is well known, has been due to the increase in the capacity of locomotives and cars, in the weight of rails and in the replacement of bridges with heavier structures. Even more rapidly the sentiment of lake vessel owners has crystallized about the 10,000 to 12,000 ton boat as the carrier of the future, and the wiping out of the 4000 and 5000 ton boat as an instrument of ore transportation will soon be almost as complete as the elimination of the 70-pound rail from trunk line construction or of the 40,000-pound car from the bulk freight traffic of the railroads. The few 6000 and 7000 ton boats built four and five years ago were at first thought unwieldy, and as they could be handled only at certain docks the fashion did not spread. A conservative size was thought for a time to be the boat of the future. Even as recently as one year ago it was seriously debated whether the so-called big boats were not likely to be in less rather than greater favor. But the past year has developed a veritable boom for still larger capacities and to-day we have the 600-foot vessel, capable of carrying 12,000 tons, as representing the best thought and experience of vessel builders and of the owners of the largest ore fleets on the lakes.

It is to be questioned if the effect of thus doubling the capacity of the largest type boat in five years has been properly measured in some of the more conservative estimates of the future of lake shipbuilding.

Rapid Transit Plans for Greater New York.

Financiers, as well as citizens of New York generally, are interested in the merging of the Interborough Rapid Transit Company and the Manhattan Street Railway Company. On January 1, 1903, the Interborough Company acquired control of the Manhattan Elevated Railroad Company, which owned all the elevated lines in the city, and consolidation just effected places the control of all subway, surface and elevated railroad transportation facilities in the Borough of Manhattan under one management. The Brooklyn surface and elevated system are as yet independent. Before the close of the year it is probable that the Interborough Company will have completed its extension from the Battery under the East River to Brooklyn, thereby gaining traffic entrance to that Borough.

But more important than these developments is the action that will probably be taken by the Rapid Transit Commission in the near future. Since its creation in 1894 the commission has labored to provide additional rapid

transit facilities in order to relieve the congested sections of the city. But, more essential than this, it has from the first striven to perfect a plan of rapid transit that would embrace all the boroughs of Greater New York, with the exception of Richmond. The problem was composed of many separate and distinct parts, each having characteristics peculiar to itself. These had to be so arranged and interwoven with each other as to constitute a symmetrical entity.

Three considerations were of vital moment in preparing the plans. The elevated roads had to be recognized as forming integral parts of future rapid transit systems. They already occupied the field to a certain extent and served as carriers between thickly peopled districts. But their capacity was taxed to the utmost and relief had to be obtained in the shortest possible time. The pressing necessity was to diminish the congestion. The most natural solution was the construction of north and south lines uniting the financial and shopping districts with the residential. The result was the subway.

The subway was not expected to afford permanent and complete relief; it was known that it would be adequate for a limited period only. But to-day, only 14 months after its opening, it is overcrowded, and this without reducing the travel on the elevated roads. Conditions now are as bad as they were in 1900, when the subway contract was let, and relief is again imperatively demanded. The subway forms the center or hub of the entire rapid transit scheme. It unites harmoniously with the other routes that have been laid down by the commission.

The third consideration called for convenient and logical means of enlarging the system in order to meet requirements of the future. This included the extension of routes into territory not now served and the more thorough covering of crowded districts. This has been accomplished by new lines reaching out from the center and by the adoption of loops at the ends of the lines in Brooklyn and the Bronx; these permit extension of the lines without in the least disturbing existing roads and without requiring reconstruction or rearrangement.

At this moment the vital question is, Which of the 19 routes laid down by the Rapid Transit Commission will be built immediately? The commission has not made public its intention, and it is only possible to conjecture its probable course. The shopping district and that south of Chambers street most strikingly need better facilities. These can be furnished by north and south routes in Manhattan and routes to Brooklyn. It is very likely that both will be advertised at no distant day. The plans provide for 14 tracks across the East River south of Thirty-fourth street, and 20 tracks north and south in Manhattan. All of these except the Fourteenth and Thirty-fourth street routes enter and serve the downtown district. In addition there are tracks to occupy all the East River bridges, including the Manhattan and Blackwells Island. It is probable that at least two lines to Brooklyn and two north and south lines will be advertised.

That the Interborough Company will be a bidder for these franchises is a foregone conclusion; that it will have the field alone is by no means certain. In financial circles it is thought, and seemingly upon sound ground, that there will be strong competition for the privileges. For many months financiers have had before them one fact shining with dazzling radiance—the subway is the first railway of any magnitude that paid all operating expenses and interest on its cost of construction during the first year of its existence. It must be borne in mind that this has been done, not at the expense of the elevated roads which were paralleled by the subway, but by what appears to have been a large increase of the traveling public. It is believed that history will repeat itself and that new lines will find an immediate and paying patronage.

One other vital factor cannot be ignored. The commission will most certainly consider every bid in the light of the advantages the bidder may be able to offer the traveling public. This will give the Interborough Company a tremendous advantage, since by offering liberal transfers with its present systems it can cover every section of Manhattan and the Bronx and, with the extension from the Battery, a large part of Brooklyn. But capitalists are not as timid now as they were six years ago when John B. McDonald found it extremely difficult to find backing to enable him to construct the subway, and new and independent interests are expected to enter the race. There is one other fact that must not be overlooked: The Interborough Company, with its absolute control of all the lines in Manhattan, is not strong enough to dictate the terms upon which it will undertake the construction of additional lines. The powers of the commission are very large and the wisdom that guided the subway to a successful completion is still at the service of the city.

Trade Literature.

Those who have occasion to examine many catalogues issued by manufacturers will be struck by the frequency with which the introduction leads off with a long dissertation on location, plant and facilities for manufacturing, making these a plea for patronage. A catalogue which recently came to our attention departed from this custom and substituted a much more impressive argument—an invitation to the reader to visit the company's works and judge its qualifications for himself. To be sure, there will not be many to whom the catalogue is addressed who can take advantage of this invitation, and it might be said that any concern could with impunity make the offer on the small chance of its acceptance. However that may be, we know that in the present case the courtesy was sincerely extended. This company is not an exception in throwing its works open to the public; there are many others equally free, and practically all might pursue the same liberal policy. The industries in which advantages accrue from secrecy in regard to methods are comparatively few, and the danger that valuable information may be gained by rivals is generally magnified in the minds of the conservative more than the real situation would warrant. As against the false impression which too much secrecy creates in the eyes of the customer the value of barred doors is insignificant. In the interest of advancement what is needed is a spirit of reciprocity such as exists among professional men, who freely impart the knowledge gained from their experience in papers and discussions at conventions or through the columns of the press.

But this is somewhat of a digression from our intention to criticise briefly the more common faults in trade publications generally and to suggest lines of improvement. One great point is the matter of size. Those who keep files of trade publications to any extent are always annoyed by the variation in size which makes them inconvenient to dispose of. One standard size is out of the question; two, three or, at the most, four might easily be made to cover all classes of publications with rare exceptions. It is not for us to recommend what

these sizes should be; it is a matter which has been agitated much and undoubtedly will be more before the evil is remedied. A suggestion worthy of consideration is that manufacturers' associations appoint committees to decide on what should constitute the standard classifications.

Another point often neglected is the proper indexing of a catalogue which covers a wide range of product and contains a great number of pages. In such catalogues a very desirable feature would be a logical grouping and arranging of the subject matter which should be explained in a few introductory remarks and not left to the user of the catalogue to discover for himself. This would greatly aid a busy man in placing his finger on the matter needed with the least delay.

In many catalogues the error is in the direction of too many illustrations and too little text, while in others it is the reverse. The happy medium may easily be struck in catalogues concerned with some one machine or a single line of machines, but the difficulty increases as the catalogue becomes more comprehensive. Brevity is imperative in general catalogues issued by manufacturers of an extensive product, but better no catalogue than one which loses its value by too much condensation. In cases of this sort special catalogues on separate lines of product should be freely resorted to and the existence of these made known in the general catalogue, so that the prospective customer may obtain more detailed information on the subject in which he is interested. In catalogues of machinery and tools it is particularly desirable that tables and specifications of the various sizes should be included. In no way can so much information be contained in so small a space. In perhaps 99 out of 100 catalogues of power driven machinery the most serious omission is a statement of the power required for driving. The amount of correspondence entailed to obtain such information is one of the annoyances intending purchasers have to contend with.

Advice on specific points might be continued almost indefinitely, but just this one "don't" in conclusion: Don't put the compiling of your trade literature in the hands of a small caliber clerk, but put at the task the best brains at your disposal. The preparing of trade literature, if it is to be of value, should be intrusted to the most experienced man or men in your employ. Then the benefit you have a right to expect from it will be yours.

The Passing of the Contract Shop.

It was not many years ago that contract shops, which marketed no products of their own, but confined their efforts to manufacturing for others, were numerous and therefore quite important as an industrial factor. Some of these shops still exist and a few are prosperous, but one seldom hears of a new contract shop. Industrial conditions have so changed that there is less field for them, and compared to the increase in commercial manufacturing plants they have sunk into insignificance. Their usefulness remains to an extent, however, and if they entirely disappeared their loss would be keenly felt. The contract shop is sought by certain people who have something to make for the market and who do not wish or cannot undertake the burden of manufacturing, preferring to concentrate their energies on the selling of the product. It develops the ideas of others and frequently produces the first lot of goods for the market, while in the old days it often continued the manufacturing for years. To-day the owner of the article usually prefers to take up the manufacturing for himself that he may get all the profit. Sometimes experience teaches that the price which the market will pay is not sufficient to provide two profits, one to the contract shop and another to the owner. Most of the shops have now developed regular products of their own and contract work has become a side issue, or at most only a part source of income. In other words, they have ceased to exist exclusively as the contract shops of a generation ago. In some sections of the country small machine shops have taken away much of the class of work that they used to do. The builders of special machinery have cut into the field by developing economical and practical manufacturing processes for owners of ideas. The change in the status of the contract shop is merely another result of the rapid evolution of business methods and conditions which has come within the last generation and especially during the past decade.

Russian and Japanese Machinery Purchases.

A traveling representative of an American manufacturer of special machinery tells a story which is at least quite interesting regarding an experience with both Russia and Japan. In the summer of 1904 a machine for a certain class of marine work was brought out and a sample machine was sold to each government. As it did its work very satisfactorily, as well as economically, the manufacturer was chagrined to find its value unappreciated, no further orders coming from either country. The traveling representative aforesaid was sent to investigate. In a storehouse in a Russian navy yard was found the sample machine sold to the Russian Government, not only rusted and unserviceable but showing by its unassembled condition that it had never been put to actual use. In Japan the sample machine was not found, but in a navy yard visited were at work a large number of similar machines which had been built by the Japanese. Certain comments will naturally suggest themselves to the reader. One that may not occur to everybody is that possibly the Russian experience is the more satisfactory from the American standpoint.

It is safe to predict that before the end of 1906 power plant owners will have a much wider choice of steam turbines. Much is being done to develop the turbine by others than the great companies, which are already putting them on the market. Among these are prominent engine builders who realize that, although the reciprocating engine will always be widely useful, the steam turbine also has come to stay, and that it will be to their advantage if they are able to supply both demands. The turbine has developed rapidly, but there are still many problems to be solved and many improvements are to be expected. Doubtless the efficiency of the smaller sizes of turbines will be increased, which will make them more popular with owners of small plants. It is known that several new turbines will be introduced during the year by established engine companies, while new companies are forming to manufacture them. On the whole the year promises to be eventful in the history of the steam turbine.

Statistics have just been compiled of coal loaded into vessels at ports on the south shore of Lake Erie last year. The total of coal shipped to upper lake ports was 9,297,480 tons against 10,574,198 tons for the preceding year. The shortage of cars is given as one reason for the falling off. It appears that Ohio mines did not ship as largely as in 1904, the estimated production being 18,000,000 tons in 1905 as against 19,600,000 tons in the preceding year.

CORRESPONDENCE.

The Saniter Desulphurizing Process.

To the Editor: In my "Biographical Notice of Sir Lowthian Bell"* I said that the Clarence Works "used among the very first the Saniter desulphurizing process, though later developing another way of desulphurizing better suited to their conditions." This "other way" was to use calcium fluoride instead of calcium or ferrous chloride, the substances with which the Saniter process is generally associated. But as the use of calcium fluoride also is covered by the Saniter patents the second of the clauses which I have just quoted is misleading. What the Clarence Works really did was to turn from the regular and typical Saniter process and develop a special variety of it. My informant no doubt had the usual form of the process in mind, and I find that Sir Hugh Bell also had when, in kindly examining my manuscript, he passed by without comment the words which I have here quoted. It is in justice to Mr. Saniter, who calls my attention to the matter, that this note is written. HENRY M. HOWE.

NEW YORK, January 3, 1906.

The Luermann Cinder Tap.

To the Editor: In the spring of 1875 there was not a blast furnace in America, so far as known, using the Luermann notch, though some furnace owners had paid royalty and were sore about it. George Asmus, Mr. Luermann's agent in this country, furnished the Durham furnace with Luermann's drawings of the notch and they were strictly complied with. Mr. Asmus was present and gave instructions how to use it when the furnace was running. When the notch failed at Durham Mr. Asmus could suggest no remedy when asked to do so.

If Mr. Luermann knew the bronze notch was the best (which is the case), why did he not show it on his drawings and have Mr. Asmus put it in at Durham? The improvements in the notch were put in at Durham after the furnace had blown out on account of a scaffold, partly caused by the frequent stoppages by the notch. The hotter, larger volume of cinder from our American furnaces proved too much for the original Luermann notch.

The writer has always been a firm advocate of the Luermann cinder notch, and that his efforts have done more for its introduction and success than Mr. Luermann imagines will be made clear on careful examination. JOHN M. HARTMAN.

PHILADELPHIA, PA., January 3, 1906.

New Rolling Mills and Steel Works.

Numerous Additions to the List of Small Steel Foundries.

A supplement to the December 30 issue of the *Bulletin* of the American Iron and Steel Association presents an interesting exhibit of the new rolling mills, steel works, bloomeries and tin plate works put in operation since June 1, 1904, the date to which the last directory of the association was corrected. In addition a list is given of works in course of erection in December, 1905; a list of works abandoned or dismantled since June, 1904, and a list of similar works projected in December, 1905. A feature of the list of new works is the large number of new steel casting plants built either to manufacture castings for the trade or as new departments of users of steel castings. The rolling mills, steel works, bloomeries and tin plate and terne plate plants described below have been completed and put in operation, with a few exceptions, since June 1, 1904:

Rolling Mills and Steel Works.

Baldwin Steel Company, 107 John street, New York. Works at Cold Spring-on-Hudson, N. Y. Built in 1903; one 24-pot crucible steel furnace; first products rolled in February, 1905. Product, tool steel; annual capacity, 1800 tons.

Brooklyn Navy Yard, Bureau of Construction and Repair, Brooklyn, N. Y. One 2 gross ton Tropenas steel converter and one cupola built in 1904. Product, steel castings for ship work; annual capacity, 1200 tons.

Riverside Foundry, Newark, N. J. Built about 1885; 12 four-pot crucible steel furnaces added in 1901; acquired by present owners in January, 1905; annual capacity, 600 tons of steel castings.

American Duplex Steel Company, 715 Park Row Building, New York. Works at Bradford, Pa. One special 20 gross ton semiopen hearth steel furnace and two patented converting annealing furnaces; first castings made June 1, 1904; annual capacity, 5000 tons of Duplex steel and malleable iron castings.

Ambridge (Pa.) plant American Bridge Company. One 15-ton acid open hearth furnace added to a bridge building plant in 1905; annual capacity, 5000 tons of castings.

Crucible Steel Casting Company, Lansdowne, Pa. Two eight-pot crucible steel furnaces; annual capacity, 500 tons of steel castings.

Fort Pitt Malleable Works, Fort Pitt Malleable & Gray Iron Company, McKees Rocks, Pa. Two 15-ton acid open hearth furnaces and 15 annealing furnaces. Product, malleable iron castings, but steel castings could be made.

General Castings Company, Verona, Pa. (a suburb of Pittsburgh). One 20 gross ton Smythe acid open hearth furnace; annual capacity, 14,400 tons of steel castings.

Hydraulic Machine Company, Pittsburgh. Two 15 gross ton open hearth steel furnaces (one acid and one basic); steel castings.

Interstate Steel Company, Brackenridge, Pa. Six sheet and pair furnaces, six annealing furnaces; black sheet steel and polished blue sheets; 19,000 tons a year.

Latrobe (Pa.) Works, Firth-Sterling Steel Company, lessee, Pittsburgh. Product, crucible steel ingots; annual capacity, 3000 tons. Owned by the Burns Uniform Steel & Metallic Company, Pittsburgh.

Meyersdale Sheet Steel Company, Meyersdale, Pa. Construction commenced in July, 1904. Annealing, heating and sheet furnaces and three sheet mills. Product, light steel sheets and range plates; 8000 tons a year.

National Transit Company, Oil City, Pa. One 4-ton acid converter, one crucible steel furnace, one 1000-pound Schwartz furnace. Product, steel, brass, bronze and iron castings.

Pottstown Works, Stanley G. Flagg & Co., Philadelphia. Works at Pottstown, Pa. Twelve-ton open hearth furnace added in 1899. Product, malleable iron castings, but steel castings can be made.

Seamless Tube Company of America, Monessen, Pa. First operated in 1905. Seamless steel tubes from billets.

Sharon Foundry Company, Sharon, Pa. One 20-ton acid open hearth furnace added in 1905. Annual capacity, 12,000 tons of gray iron and 9000 tons of steel castings.

Standard Roller Bearing Company, Philadelphia. Crucible steel furnaces added in 1905. Annual capacity, 1500 tons.

Sweet's Steel Company, Williamsport, Pa. Three 12 gross ton basic open hearth furnaces. Annual capacity, 25,000 tons of ingots and 30,000 tons of rolled and forged products.

Brylgon Steel Casting Company, New Castle, Del. Two 2-ton Bookwalter converters. Annual product, 3000 tons of steel castings.

Follansbee Brothers Company, Pittsburgh. Works at Follansbee, W. Va.; completed in 1904. Eight heating furnaces, 7 annealing furnaces, 4 sheet mills and 11 black plate mills. Annual capacity, 20,000 tons. Also five sets for tin plates and five for terne plates. Weekly capacity, 3000 boxes of each.

Watson Iron & Steel Company, lessee, Pittsburgh. Works at Paden City, W. Va. Three sheet furnaces, three pair furnaces, two annealing furnaces and five trains of rolls. Annual capacity, 6000 to 7000 tons of steel sheets. Also two partly erected Siemens open hearth steel furnaces, upon which work has been indefinitely suspended. Not operated to December, 1905.

Birmingham Steel & Iron Foundry, Birmingham, Ala. One 10-ton basic open hearth furnace. Annual capacity, 6000 tons general machinery castings. This company succeeds the Hood Machine Company.

Fort Worth Iron & Steel Mfg. Company, Fort Worth, Texas. Works at Dolard. Four puddling furnaces, three busheling furnaces. Annual capacity, 7500 tons of merchant bar iron.

Continental Steel Company, Cleveland. Works at Chagrin Falls, Ohio. One four-pot crucible furnace. Product, high grade crucible and high grade carbon steel and castings. Two four-pot crucible furnaces to be added.

Dover forge of Dover Forge & Iron Company, Canal Dover, Ohio. Product, iron forging billets, muck bar, scrap bar, iron sheet bars and charcoal iron tin plate bars; annual capacity, 30,000 tons. Also a forge for charcoal blooms, slabs and billets.

C. E. Sutton Company, Toledo, Ohio. Three cupolas and two 2-ton Tropenas converters added in 1905 and first blow made in June, 1905. Annual capacity, 1800 tons of machine castings.

Atlanta Rolling Mill & Tin Plate Company, Atlanta, Ind. Completed in 1905; will probably start in March, 1906. Eight black plate mills. Annual capacity, sheets and tin plates for tinning, 14,000 tons. May add six sets for tin plates early in 1906.

* Transactions of the American Institute of Mining Engineers, Vol. 36, to appear.

Haskell & Barker Car Company, Michigan City, Ind. Open hearth furnaces added in 1890. Now has five 15 gross ton acid open hearth steel furnaces, besides cupolas and air furnaces. Product, gray iron, malleable iron and occasionally open hearth steel castings.

Indiana Harbor (Ind.) Works, American Foundries, Fisher Building, Chicago. Completed in 1904. Two 20 gross ton acid open hearth furnaces; machinery, &c., of abandoned works at Fifty-ninth and Wallace streets, Chicago, used in part. Annual capacity, 30,000 tons.

Columbia Tool Steel Company, Chicago Heights, Ill. First crucible steel made May 9, 1905. One 30-pot crucible furnace and two trains of rolls. Annual capacity, 2000 tons rolled and hammered tool steel and crucible machinery steel.

Missouri Malleable Iron Company, East St. Louis, Ill. Open hearth steel furnace added in 1900. Product, malleable iron castings, but steel castings could be made; annual capacity, 18,000 to 20,000 tons.

Otis Elevator Company. Works at Chicago. First steel made in August, 1905. One 3 gross ton Schwartz furnace. Annual capacity, 500 tons steel castings.

Adrian Steel Casting Company, Adrian, Mich. Built in 1905. Six crucible steel furnaces. Annual capacity, 1000 tons steel castings.

Western Malleable Steel Company, Detroit, Mich. Built in 1905. One cupola and one special steel furnace. First malleable steel castings made December 5, 1905. Annual capacity, 1000 tons gray iron and 1000 tons steel castings.

Seattle Steel Company, Seattle. Works at Youngstown, Wash. First put in operation May 6, 1905. Three trains of rolls, two from dismantled plant at Lakeview, Wash. Product, bar iron and shapes; annual capacity, 15,000 tons. Two 15-ton basic steel furnaces may be added in 1906.

Carnahan Tin Plate & Sheet Company, Canton, Ohio. Forge added to rolling mill in 1905. Annual capacity, 5400 tons charcoal blooms.

Plants Being Built in December, 1905.

The rolling mills, steel works, bloomaries and tin plate and terne plate plants described below were in course of construction in December, 1905:

Halcomb Steel Company, Syracuse, N. Y. Construction commenced in April, 1905; being equipped with basic and acid open hearth steel furnaces and crucible steel melting furnaces, hot trains of rolls and hammers. Product, hammered and rolled bars, sheets, and drawn steel wire and bars for tool steel and other high grade steel. Will probably be ready for operation in January, 1906.

Milliken Steel Works, Milliken Brothers, Incorporated, New York City. Building works at Milliken, Staten Island; being equipped with five 50-ton basic open hearth furnaces. Annual capacity, 160,000 tons of ingots. Two continuous heating furnaces and two trains of rolls (one 40-inch blooming and one structural mill). Product, beams, channels, angles, zee bars, flats, &c.; annual capacity, 150,000 tons.

New York State Steel Company, Buffalo, N. Y. Construction began December 1, 1905. Two 200-ton Talbot open hearth furnaces. Annual capacity, 100,000 to 120,000 tons of ingots. One 36-inch blooming mill. Product, slabs, blooms and billets.

Roebling's (John A.) Sons Company, Trenton, N. J. Building works at Kinkora, N. J.; construction commenced in the summer of 1905; being equipped with heating furnaces, wire rod trains, &c. Product, steel and copper wire rods. The modified Garrett wire rod mill now at Trenton will be removed to Kinkora and remodeled. Other departments of the Trenton works will not be removed.

Fischer Foundry & Machine Company, Pittsburgh. Works at Ford City, Pa. Adding one Raapke steel converter. Product, steel castings.

Fort Pitt Steel Casting Company, Pittsburgh. Erecting works at Christy Park, near McKeesport, Pa. One 2-ton modified Bessemer converter and one cupola. Annual capacity, 1200 tons of steel castings.

Janson Steel & Iron Company, Columbia, Pa. Six double puddling furnaces, five heating furnaces and four trains of rolls. Annual capacity, 20,000 tons of bar iron and steel.

National Cast Steel Company, Wilmington, Del. Works at Avonmore, Pa. One 2-ton modified Bessemer steel converter and one cupola. Product, steel castings and gray iron castings; annual capacity, 5000 tons.

Pennsylvania Swedish Iron Company, Pittsburgh. Building rolling mill at Cheswick, Pa. Two scrap furnaces, one heating furnace and one train of rolls. Product, charcoal boiler tube skelp iron and merchant bars; annual capacity, 25,000 tons. Manufacture of charcoal iron plates and sheets will be added early in 1906, also charcoal forge.

Velte Foundry & Machine Company, Pittsburgh. Adding one modified Bessemer converter. Annual capacity, 2500 tons of steel castings.

Crescent Rolling Mills, Virginia Iron, Coal & Coke Company. Part of machinery removed from Max Meadows, Va., to Bristol, Va.; being equipped with ten double puddling furnaces, five heating furnaces, two forge fires and three trains of rolls. Annual capacity, 20,000 tons of merchant bar iron.

Broomall Iron & Steel Company, Bellington, W. Va. Construction commenced in October, 1904. Pair sheet and annealing furnaces, three steam hammers and six sheet mills. Product, iron and steel planished sheets and black sheets; annual capacity, 10,000 tons.

Kenton Iron & Steel Company, Covington, Ky. Works at Mason City, W. Va.; commenced in 1904. Product, bar iron and steel; annual capacity, 15,000 tons.

E. Cooper Wills, Bluefield, W. Va. One 5000-pound Wills converter, built in 1905, but not in place; two cupolas. Product, steel castings; annual capacity, 9000 tons.

American Steel & Tube Company, Lorain, Ohio. Combination mill for muck bar, sheet bars, slabs, plates, sheets, skelp, tubing. Annual capacity, 50,000 to 75,000 tons.

Bechtold Crucible Steel Company, 307 Schofield Building, Cleveland, Ohio. Building at Canal Dover, Ohio. One 36-pot crucible melting furnace, one 5-ton acid open hearth furnace, two trains of rolls and three hammers. Product, hammered and rolled crucible and open hearth tool steel and castings.

Byesville Works, United Sheet & Tin Plate Company, Pittsburgh. Works at Byesville, Ohio. One 50-ton basic open hearth furnace, partly erected in 1903. Work suspended.

Graham-Phillips Horse Shoe & Iron Company, Cincinnati. Building works at Hooven, Ohio. Two heating furnaces and two trains of rolls. Horse and mule shoes, bar iron and steel.

Menough Foundry Company, Incorporated, Wellsville, Ohio. Adding one 2-ton side blown Adams steel converter. Annual capacity, 3000 to 5000 tons of steel castings.

Prescott Company, Menominee, Mich. Adding two cupolas and two 3-ton Fisher steel converters. Annual capacity, 5000 tons of castings.

Bucyrus Company, South Milwaukee, Wis. Building one 10-ton basic open hearth furnace. Annual capacity, 4500 tons of steel castings.

Shaw Crucible Steel Company, Damon Point, Wash. Works for manufacture of tool and alloy steels from magnetic iron sand; to have special steel furnaces and hammers.

Meurer Brothers Company, Brooklyn. Building works at Long Island City, N. Y. Product, tin plates and terne plates; weekly capacity, 5000 boxes. Will buy black plates. Brooklyn plant will be dismantled.

Minnequa Works, Colorado Fuel & Iron Company, Denver, Col. Building tin plate department at Pueblo, to be equipped with 22 sets. Weekly capacity, 8000 boxes of tin plates and 2000 boxes of terne plates. Completion indefinite.

Plants Projected in December, 1905.

A list of rolling mills, steel works and tin plate and terne plate plants which were projected in December, 1905, is given as follows:

New England Steel Castings Company, Trenton, N. J. Contemplates erecting works for special steel castings.

F. L. Baldwin, Portsmouth, Ohio. Company proposes to erect one 24-pot crucible melting furnace and three steam hammers (800, 1000 and 4000 pounds). Product, tool steel and castings.

Bucyrus Steel Casting Company, Bucyrus, Ohio. Plans one 20-ton basic open hearth furnace. Product, steel castings.

Keystone Steel Company, Sebring, Ohio. Contemplates manufacture of steel by a special process.

Lee & Rieske Company, Loveland, Ohio. Contemplates manufacture of crucible steel, Bixby's patent couplings and other steel castings.

Steel Foundry Company, Cincinnati, Ohio. Contemplates one 10-ton acid open hearth furnace. Annual capacity, 4200 tons of castings.

Ward-Dickey Steel Company, Indiana Harbor, Ind. Works equipped to manufacture hammered planished sheet steel. Contemplates adding hot trains of rolls.

Flagler Iron & Steel Company, Chicago Highlands, Ill. Building works for lap weld boiler tubes and pipe. May add hot trains of rolls in 1906.

Peoria Steel & Tool Company, Peoria, Ill. Commenced in 1904 the erection of a plant at Peoria, Ill., to manufacture crucible steel and hot rolled iron and steel. Construction suspended; property for sale.

Carroll Foundry, Houghton, Mich. Expects to add one 2-ton Tropenas converter for steel castings.

Monarch Coupler Company, Limited, Detroit, Mich. To erect at Delray, Mich., one 15-ton acid open hearth furnace for steel couplers and knuckles. Annual capacity, 6000 tons.

Vulcan Iron Works, Seattle, Wash. Iron and steel bolts and nuts. Contemplates adding hot rolls.

Abner Doble Company, San Francisco, Cal. Contemplates one 10-ton basic open hearth furnace in the Potrero. Annual capacity, 6000 tons of steel castings.

Abandoned Works.

A list is also given of 54 abandoned or wholly or partly dismantled rolling mills and steel works. Most of these plants were small, and in the case of a good many of the rolling mills belonged to companies having no steel plant. The list includes also a considerable number of iron rolling mills dismantled by the Republic Iron & Steel Company and a few works of the American Sheet & Tin Plate Company.

The Corrosion of Fence Wire.

Report of Investigation by Department of Agriculture.

WASHINGTON, D. C., January 9, 1906.—An investigation into the causes of the corrosion of wire used for fencing has been made by the Department of Agriculture with a twofold purpose in view. The first object is to furnish information to the farmer which will enable him to exercise intelligent judgment as to the difficulties involved in the manufacture of wire fencing which shall be low in price and at the same time resistant to rust and corrosion. The second object has been to determine, with the co-operation of progressive manufacturers and metallurgists, the causes which underlie the much too rapid corrosion of modern steel wire and if possible to suggest improvements in methods of manufacture by means of which the difficulties may be at least partially, if not wholly, overcome. There is reason to hope that something has been accomplished, and that the future will show a substantial improvement in the lasting quality of the galvanized wire turned out by the manufacturers. Through the courtesy of the Secretary of Agriculture the writer is enabled to present an advance abstract of the report upon this investigation, prepared by Allerton S. Cushman, Assistant Director of the Office of Public Roads.

Complaints As to Quality of Wire.

The earlier correspondence that was carried on in the effort to get at the facts showed that a great many farmers believed that the manufacturers have neither the intention nor the desire to make the best possible wire. On the other hand, some manufacturers held that if it were possible to make a higher grade of wire at even a slightly higher cost it would be useless to attempt it, as the farmer desired cheapness above every other consideration. It is safe to say that neither of these extreme views has been substantiated by the evidence gathered during the progress of this investigation. The majority of farmers in this country know that a fence that will last in good condition for 20 years is cheaper than one that costs one-half as much money and is useless in five years. It is equally true that American manufacturers have for the most part shown themselves not only willing but anxious to contribute in every possible way to the success of the investigation, and have given evidence of their desire to make the best product consistent with their knowledge and the trade conditions that have to be met.

It is frequently asserted that wire for fencing is manufactured from the refuse of the furnaces and the junk piles and that the metal used in forming the galvanized coating is largely adulterated with metals cheaper than zinc. The first contention shows ignorance of the fact that refuse metal of this kind could never be drawn to the form of wire, and that any manufacturer who followed such methods would speedily find his finished product on his own junk pile; and as to the second contention it may be said that if it is true no indication of the fact has been discovered during the course of the investigation. It is therefore presumed in this discussion that the farmer desires to purchase fencing that will be good and at the same time as cheap as is consistent with the greatest efficiency and economy and that the manufacturer is willing to supply this legitimate demand so far as he can.

A Metallurgical Problem.

The real cause of the trouble is a metallurgical problem and requires careful and impartial consideration. For some time numerous complaints from different sources have reached the Department concerning the inferior lasting quality of the steel wire fencing which is to be found in the market at the present time. While some of these claims may be considered extreme they also contain much that is true and worthy of careful investigation. At all events a very large amount of evidence can easily be obtained to show the truth of the original contention that the older iron wire is much more durable than modern steel wire. There is no question that the higher priced wire that is manufactured for telegraphic purposes is more durable than that used for fencing and the reasons for this will be developed later.

Evidently the first thing to be done in this inquiry was to ascertain beyond all doubt whether the older wire, as claimed, did outlast modern steel wire; and second, to determine if possible the reason for this. A large number of letters were received from all over the country in response to official inquiry and all pointed in the same direction. As far as human testimony is capable of establishing a fact there need be not the slightest question that modern steel does not serve the purpose as well as the older metal manufactured 20 or more years ago.

A great number of samples of wire were sent to the Division of Tests, and a series of analyses were made to see whether chemical analysis would throw any light on the subject. It soon became noticeable that the majority of the old wires sent in which were in good condition were either free from manganese or contained only very small amounts—0.2 per cent. or under—of this metal. It is true that many of the good wires ran as high as 0.5 per cent. and even higher in manganese, but the fact was nevertheless noticeable that the bad wires with very few exceptions contained manganese, while the good wires were frequently if not always free from it.

Effects of Manganese.

The results of these preliminary experiments pointed undoubtedly to manganese as having something to do with the matter. The great difficulty was in explaining the exceptions. After a great deal of experimental work had been done in the chemical laboratory, however, one possible explanation appeared that might account for the facts obtained. Manganese dissolved in iron up to a certain percentage is known to increase the electric resistance of the metal. This means that iron wire containing manganese will resist the passage of electricity through it to a greater extent than a wire that contains little or no manganese. In case the manganese were not dissolved or mixed with perfect uniformity throughout the iron electrical currents might be generated in the wire when wet which would lead to rapid corrosion. In order to get a practical opinion as to whether manganese was thought to have anything to do with the lasting quality of steel the president and general manager of a company which is an enormous consumer of wire was appealed to, with the result that the following opinions which had been formed as the result of practical experience were received:

1. Bessemer or mild steel wire will rust or deteriorate much more rapidly than iron wire, in all probability three times as rapidly, although this is only an approximation.
2. The more manganese there is present the shorter will be the life of the metal.
3. In soft steel the manganese will reduce the conductivity of the wire fully 50 per cent. below the conductivity of wire containing only a trace of manganese.

It seemed from this that before the laboratory investigation instituted by the Department of Agriculture had been made practical experience had indicated that manganese was at the bottom of the trouble. In further support of this conclusion statements by James P. Roe, in a paper on the manufacture and characteristics of wrought (puddled) iron, which was presented before the Washington meeting of the American Institute of Mining Engineers in May, 1905, may be referred to; also a letter to the Department from Dr. Henry M. Howe, an experienced metallurgist and the author of several well-known books on iron and steel. With this evidence the following two points are accepted, at least for the time being:

1. That modern Bessemer and open hearth steel rusts much more rapidly than iron wire. 2. That manganese, especially if it is unevenly distributed in the steel, is at least in part the cause of the trouble.

Electrolytic Action.

In order to pursue the inquiry further it will be necessary to show just how the manganese can have the bad effect that it has. There is reason to believe that the cause of the rapid deterioration of steel fence wire has been traced to electrolysis induced by unequal distribution of manganese or other impurities. Wire that is hung in the field is in just the condition to suffer from electrolysis if the metal is not perfectly homogeneous in

structure—that is to say, if the manganese and other impurities are not perfectly distributed throughout the metal. All rain water contains small amounts of salts dissolved from the dust in the air and is therefore a conductor of electricity. Differences of potential will occur in the wire, local circuits will be established through the wires or through the wires and ground and currents will flow. This explanation is capable of accounting for the deep pitting observed in the corrosion of many wires, this pitting being characteristic of electrolytic action.

If manganese is unevenly distributed in the metal, why, it may be asked, have chemists generally failed to notice the fact in the course of large numbers of duplicate analyses that have so frequently been made? The answer to this question lies in the fact that such extremely small differences in the chemical composition as might easily escape detection in ordinary chemical analysis are still sufficiently large to account for slight differences of electrical potential. Metallurgists claim that even when a molten bath of metal is very evenly mixed in the beginning the ingot made from this metal will show a certain amount of unevenness, owing to segregation, which takes place while the ingot is cooling.

Although it is probable that the effects of electrolysis in a fence wire are extremely small it must be remembered that they are continually going on whenever the wire is wet. In almost all modern steel woven wire fences some wires will be found to far outlast others, independent of the original weight of the galvanized covering which they carry. If in woven wire fence all the wires would last as well as the best ones do there would have been no complaints and this investigation would never have become necessary. It is just this point of unevenness of lasting quality in wires from successive heats in the same mill, which have practically the same chemical composition, that is hard to explain by any theory but that of galvanic or electrolytic action. The manufacturers have believed that the whole trouble was in the unevenness in the weight of zinc covering that was put on the wire, but experiment and observation show that this is not so. Some wires will go to pieces before others, although there is no discernible difference either in the weight or quality of the zinc covering. In one fence, which has been under observation for four years, one wire was in perfect condition, although it carried a light covering of zinc, while the wire next to it was badly rusted from end to end. Careful chemical analyses were made of these two wires, and in order to check the results secured samples were sent to the most eminent iron chemist in the country. This chemist reported the following constituents:

Analysis of Wires.

Constituents.	Good wire. Per cent.	Bad wire. Per cent.
Carbon	0.17	0.17
Manganese	0.45	0.53
Phosphorus	0.092	0.096
Silicon	0.070	0.060
Sulphur	0.059	0.083

Commenting upon this, the chemist says: "You will note that, so far as these two samples go, there is very little difference in the wire and practically no explanation chemically as to why one should be good and the other bad. They might almost be from consecutive heats from the same Bessemer converter; I do not think they are from the same heat. Notwithstanding this similarity of analysis of the samples which we have examined it is more than probable that there may be quite unequal distribution of the manganese in the two samples."

It would seem that the easiest way to prove once and for all whether unequal distribution of the impurities is at the bottom of the trouble would be to take a great number of analyses of samples taken from different parts of just such wires as these. Unfortunately, however, the slight but unavoidable errors of chemical analysis are apt to be as large if not larger than the slight differences we are trying to detect. It is also probable that the problem is complicated by the variation of more than one element. For instance, the combination of manganese and sulphur is known to show a larger difference of potential to iron than manganese alone. It would be natural to suppose that the easiest way to correct the trouble would be to cut down in the process of manufacture as much as possible the impurities that are present, but the difficulties in the way of doing this will now be understood.

Leaving the subject of laboratory investigations we may now turn to the result of observation in the field. Almost every one who has taken the pains carefully to inspect woven wire fence as it is exposed to the weather on the farm has observed that some of the wires go to pieces much more rapidly than others. The bottom wires, lying close to the ground, which are kept wet in summer by the growth of weeds and grass and in winter by melting snow are naturally the ones which we should expect to rust most quickly. As a matter of fact, however, they almost never do so, but on the contrary are far more lasting than the wires farther removed from the ground. This observation has been substantiated by a large number of competent observers. Furthermore, wires that are stapled to living trees will almost invariably be preserved to some extent in the immediate neighborhood of the point of contact. One explanation that has been offered for these undoubted facts is that a certain protection from wind and weather is furnished by the growth about the wires, but this explanation is far from satisfactory. One would not seek to preserve iron from rust or zinc from corrosion by laying these metals away in wet snow or weeds. If, however, electrolysis takes place, and if the action can be diminished by keeping the wires electrically neutral through frequent connections to the earth or through frequent short circuits, we should then expect that wires which were kept along their whole length in constant contact with the earth would in the long run show greater lasting quality. Experiments are at present being made to test the effect of earthing the fence by frequent connection to the ground.

Effect of Double Galvanizing.

A very much better covering and perhaps a more durable wire can be made by what is known as the double galvanizing process. The double process does not, as its name implies, mean that more than one coating of zinc is put on, but only that about twice as much zinc by weight is carried by the wire. In the double process the wire is drawn much more slowly through the zinc bath and does not pass through asbestos wipers, but is smoothed by passing through a shallow bed of slightly damp charcoal powder. Telegraph wire is usually treated by this method and is generally acknowledged to be more durable than fence wire, but it is worth noting at the same time that care is exercised in the manufacture of telegraph wire to keep the manganese low, because the presence of this element increases the electrical resistance of the wire. The difficulty experienced in rolling low manganese steel and the slow rate of speed at which the mill must be run to draw the wire through the zinc bath in the double process add materially to the cost of the product. It is a question that cannot be decided here whether or not high grade fence wire is worthy of the same care and consideration that is given to wire which brings a higher price in the market and which is intended for other purposes. Within certain practical and possible limits it is probably true that other things being equal the wire with the heavier zinc coating per unit of surface area will be the most resistant to weather conditions.

None the less, in the opinion of the writer and for the reasons already outlined, the problem will not be solved until attention is directed to obtaining the proper condition in the wire itself. Although the Department of Agriculture cannot undertake to make specifications it is highly probable now that the attention and interest of manufacturers has been aroused a substantial improvement in the rust resisting character of fence wire will follow in the future. One of the prominent manufacturing companies claims to have already solved the problem of making a better wire. If these expectations are justified, and even if such improvements remain to some extent trade secrets, there is no question that the farmer will soon begin to get the benefit of the better quality of fencing which will result from the persistent effort on the part of manufacturers to improve their product and distance their competitors. W. L. C.

Decreasing Pig Iron Production.

The Total Output in 1905 Was About 22,930,000 Gross Tons.

The production of coke and anthracite pig iron in the United States in December, 1905, is shown by the statistics below to have been 2,052,397 gross tons. The rate of production in December, however, was less than that of November. While 31 days' operations in December should have given about 67,000 tons more than November, a month of 30 days, the actual increase over the November output was only 39,000 tons, and the weekly rate of production on January 1 was 466,302, against 475,814 tons December 1. The blowing out of furnaces for repairs—the number and capacity of those going out being greater than of those blown in in the month—is telling on production. In Illinois the falling off from the production in November was marked, and in Alabama there was a loss of product through bankings for the holidays.

Our statistics show that the production of coke and anthracite pig iron in the United States in 1905 was about 22,585,000 tons. Adding 345,000 tons for the production of charcoal furnaces gives a total of 22,930,000 tons.

The following table shows the production for December as compared with the preceding four months:

Monthly Pig Iron Production.

	August. (31 days)	September. (30 days)	October. (31 days)	November. (30 days)	December. (31 days)
New York	102,090	102,419	111,503	113,098	120,016
New Jersey	25,500	24,030	27,292	23,657	21,548
Lehigh Valley	46,329	47,044	53,028	53,245	57,503
Schuylkill Val.	34,372	37,120	40,390	36,929	41,150
Lower Susquehanna and Lebanon Val.	72,203	69,997	71,901	68,490	65,907
Pittsburgh dis.	488,119	449,632	495,379	466,457	488,346
Shenango Val.	137,181	151,804	169,388	165,876	176,009
West. Penn.	107,225	100,882	107,880	106,327	114,559
Md., Va. and Kentucky	76,975	77,230	81,539	84,209	79,749
Wheeling dis.	75,502	98,097	110,736	114,448	120,147
Mahoning Val.	126,274	153,758	166,465	154,363	162,052
Central and North. Ohio.	136,161	151,233	162,452	162,763	173,453
Hocking Valley and Hanging Rock	29,374	31,166	27,796	26,924	33,902
Ill.,Mich.,Minn., Wis., Mo. and Col.	221,542	242,733	251,864	267,210	229,815
Alabama	131,261	129,779	144,804	147,299	138,923
Tennessee, No. Carolina and Georgia	33,565	32,576	30,757	22,340	29,318
Totals	1,843,673	1,899,500	2,053,174	2,013,635	2,052,397

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Ashland, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of product month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

Production of Steel Companies.—Gross Tons.

	Pig —Total production.—			Spiegeleisen and ferromanganese.	
	1903.	1904.	1905.	1904.	1905.
January	.....	502,994	1,129,042	6,673	21,002
February	.....	756,260	1,027,937	12,961	22,431
March	.....	913,412	1,232,255	23,128	21,280
April	966,850	974,006	1,222,710	29,145	20,038
May	1,037,325	927,534	1,287,438	25,755	24,732
June	1,021,839	788,822	1,149,404	24,950	21,761
July	987,855	694,892	1,114,409	27,284	31,220
August	993,564	747,570	1,186,050	19,280	27,461
September	956,363	936,494	1,262,033	20,723	21,645
October	829,215	971,447	1,370,960	13,669	26,799
November	553,067	962,384	1,334,644	13,442	23,776
December	406,730	1,019,841	1,356,962	13,325	29,481

Among furnaces blown out in December are one Lackawanna, at Buffalo, Andover and Musconetcong in New Jersey, Allegheny and Radford Crane in Virginia, River in the Cleveland district, one South Chicago and one Iroquois in Illinois, one Hubbard in the Mahoning Valley, one Sloss and Central in Alabama and one Allen's Creek in Tennessse.

Among furnaces blown in in December are Swede in the Schuylkill Valley, one Saucon in the Lehigh Valley, one Duquesne and one Monongahela (new) in the Pittsburgh district, Union in the Hanging Rock district, Spring Valley in Wisconsin, Struthers in the Mahoning Valley and one Dayton in Tennessee.

The table below gives the actual capacity of the coke and anthracite furnaces on January 1 and December 1. It shows that the weekly capacity of such furnaces on January 1, based on their records in December, was 466,302 tons, as compared with 475,814 tons on December 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	—January 1.— Number in blast.	Capacity per week.	—December 1.— Number in blast.	Capacity per week.
New York:					
Buffalo	12	11	24,536	12	24,431
Other New York	10	3	2,565	3	2,154
New Jersey	8	4	4,679	6	5,520
Spiegel	2	1	183	1	183
Pennsylvania:					
Lehigh Valley	27	18	12,439	17	12,670
Spiegel	2	2	490	2	453
Schuylkill Valley	13	10	9,290	9	9,079
Lower Susquehanna	10	6	7,273	6	7,947
Lebanon Valley	11	9	6,976	10	8,034
Spiegel	1	1	633	0	0
Pittsburgh district	40	39	109,281	37	105,858
Spiegel	4	3	3,514	3	2,982
Shenango Valley	21	19	39,753	19	38,704
West. Penn.	24	18	25,865	18	25,393
Maryland	5	4	7,357	4	6,967
Wheeling district	13	13	27,128	13	27,404
Ohio:					
Mahoning Valley	16	15	35,577	15	36,018
Central and Northern and Mich.	19	17	38,192	18	39,028
Hocking Valley and Hanging Rock	12	11	7,955	10	7,285
Illinois	20	15	36,490	17	42,989
Spiegel	2	2	1,120	2	1,467
Minnesota	1	1	1,277	1	1,100
Wisconsin	5	5	5,913	4	5,270
Missouri	1	1	1,029	1	1,033
Colorado	4	3	6,342	3	8,595
Spiegel	1	1	721	1	462
The South:					
Virginia	23	13	10,409	15	12,321
Kentucky	7	2	1,190	2	1,134
Alabama	46	28	31,505	30	34,438
Tennessee	16	11	6,620	11	6,895
Georgia	1	0	0	0	0
North Carolina	1	0	0	0	0
Totals	378	286	466,302	290	475,814

For a series of months the active coke and anthracite capacity fluctuated as follows in gross tons:

	Capacity per week.		Capacity per week.
January 1, 1906	466,302	December 1, 1903	244,156
December 1, 1905	475,814	November 1	273,715
November 1	460,449	October 1	353,142
October 1	445,468	September 1	360,197
September 1	412,563	August 1	353,681
August 1	410,088	July 1	384,825
July 1	408,617	June 1	388,178
June 1	443,092	May 1	373,496
May 1	452,031	April 1	386,215
April 1	439,564	March 1	347,424
March 1	403,157	February 1	335,339
February 1	405,792	January 1, 1903	346,073
January 1, 1905	377,879	December 1, 1902	336,617
December 1, 1904	357,846	November 1	330,110
November 1	334,249	October 1	337,837
October 1	319,249	September 1	328,243
September 1	291,573	August 1	328,745
August 1	246,092	July 1	303,793
July 1	272,301	June 1	337,492
June 1	336,107	May 1	337,627
May 1	368,244	April 1	331,140
April 1	337,257	March 1	316,039
March 1	308,751	February 1	325,440
February 1	273,692	January 1, 1902	291,992
January 1, 1904	185,636		

As a natural consequence of the large purchases in foreign countries made necessary by the war the foreign trade of Japan for 1905 was unprecedented. The imports totaled about $244,000,000 and the exports about $160,500,000.

NEWS OF THE WORKS.

Iron and Steel.

The Colorado Fuel & Iron Company, Denver, Col., recently converted one of its rod mills at Minnequa into a mill for rolling rounds and squares from ⅝ inch to 1 inch, and in future all of the square rods for the manufacture of railway and other spikes will be rolled upon this mill instead of on a guide mill, as heretofore.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, is adding another annealing furnace to its sheet plant in order to better handle its increased output.

The machine shop building of the Midland Steel Company, at Cook's Ferry, Pa., is now in course of erection, and the other structures will be under way within a very short time. Contract for all the structural steel work in connection with the buildings was awarded to Wm. B. Scaife & Sons Company, Pittsburgh, Pa., and will involve a very large tonnage.

The Bessemer plant of the Republic Iron & Steel Company, at Youngstown, Ohio, resumed operations after the holiday shutdown on billets and sheet bars. No rails have been made at this plant since last September.

No. 3 blast furnace of the National Tube Company, at McKeesport, Pa., which has been under erection for nearly a year, was blown in last week. The stack will be known as furnace C and will have a daily capacity of about 500 tons.

The River Furnace of the River Furnace & Dock Company, Cleveland, Ohio, was blown out December 30.

The structural steel for the rolling mill to be erected at Bristol, Tenn., by the Virginia Iron, Coal & Coke Company, is now arriving. Six carloads have come in from Middlesboro, Ky. Another train load is due from Max Meadows, Va. It is the purpose of the company to have the plant in operation some time in February. The company intends to make considerable improvements to its Radford Furnace, which was recently burned.

The Eastern Iron Company, New York, which formerly manufactured pig iron under lease at the Secaucus Furnace, has been placed in the hands of a receiver.

The Musconetcong Furnace of the Musconetcong Iron Works, Stanhope, N. J., has been blown out for repairs. It will be blown in about March 10.

The Andover Iron Company, at Andover, N. J., blew in its furnace on December 11.

The Alleghany Furnace of the Alleghany Ore & Iron Company, Clifton Forge, Va., which has been undergoing repairs, will be again blown in on January 15.

The Princess Furnace of the Princess Iron Company, Glen Wilton, Va., was shut down on December 21 for repairs.

The National Wire Corporation, New Haven, Conn., contemplates very large additions to its wire rope department, the purpose being to double the capacity for this class of product. It is also contemplated adding 1000 blocks for the fine wire department, in addition to the 1000 blocks recently purchased. The new building for the company's galvanizing department is roofed in and will be finished in a few days. This addition will be a great help to the company in supplying telephone and telegraph wire for the increased demand.

The Titusville Forge Company, Titusville, Pa., maker of iron and steel forgings, is building an addition to its machine shop, which will make it 84 x 190 feet. The building will be of structural steel and brick and will be equipped with a 25-ton electric traveling crane. This new addition to the machine shop is to be equipped with machinery for turning out high grade finished forgings. Contract for the building has been placed, and it is expected to be completed by early spring. The officials of the Titusville Forge Company are J. F. Dillon, president; B. F. Kraffert, vice-president, and Willis E. Fertig, secretary and treasurer.

The South Sharon works of the American Sheet & Tin Plate Company, South Sharon, Pa., which has been idle for some time, is expected to be started this week. The fact that the Ohio works of the Carnegie Steel Company, at Youngstown, Ohio, is now turning out sheet and tin bars will insure a larger supply of these to the American Sheet & Tin Plate Company and will allow the concern to operate its sheet and tin mills to fuller capacity than it has been able to do for some time past.

The Fort Pitt Bridge Company, Pittsburgh, works at Canonsburg, Pa., has secured the contract for the structural steel for the new building of the Commonwealth Trust Company, Pittsburgh, requiring about 800 tons.

General Machinery.

William Bayley & Sons Foundry & Machinery Company has been incorporated at Milwaukee with a capital stock of $75,000. The new company will succeed the William Bayley & Sons Company and will manufacture steam blowers, steam engines and various structural iron machinery. New buildings will probably be erected by the company in the near future.

Homer Bowes, dealer in rails, beams and machinery, Allegheny, Pa., has been appointed agent in the Pittsburgh district for the American concrete mixers, made by the American Concrete Mixer Company, Columbus, Ohio.

The Ingersoll-Rand Company, New York, is placing a great deal of additional machinery in its works at Phillipsburg, N. J. Its other shops are running full capacity, and it is probable that some minor additions will be made.

The Robertson Mfg. Company, Buffalo, N. Y., is about to move into its new factory, 1453 Niagara street, where it will have a ground floor space of 14,000 square feet equipped for handling of its rapid cut power saws, emery grinders and straight line gas and gasoline engines. An Erie City boiler has been installed for heating and an electric plant for lighting. The company would be pleased to receive catalogues from manufacturers.

For the convenience of the trade in the Northwest requiring drop forging, stamping and press work, which heretofore was obliged to have such work done in the East, the Helwig Mfg. Company, St. Paul, Minn., has added a department to its plant for doing these classes of work.

The David Bell Engineering Works, Buffalo, N. Y., has incorporated under the same title and now has increased facilities for the manufacture of steam hammers and heavy machinery. The company carries a full line of steam hammers, covering single frame open style from 250 to 1500 pounds, single frame standard guide from 350 to 2500 pounds, double frame up to 5000 pounds and steam drop from 400 to 2000 pounds.

The Standard Engineering Company, Ellwood City, Pa., designer and manufacturer of bolt threaders, pipe threading machines, pipe couplings and fittings, has recently made sales of standard Wieland and standard mill type pipe threading machines as follows: Prairie Oil & Gas Company, three; Whitlock Coil Company, one; Chalmers & Williams Company, Chicago Heights, one; John Davis Company, one; Federal Lead Company, Flat River, Mo., one; Simpson Brothers, Noblestown, one; Garfield Smelting Company, Garfield, Utah, two; Vacuum Oil Company, four; Hugh Kelly & Co., New York, two. The company reports a large demand for bolt threaders and states that inquiries for general engineering work are increasing.

James D. Wilson, receiver of the Solid Steel Tool & Forge Company, Brackenridge, Pa., has secured an order from the courts to operate the plant until it is sold, the period of operation not to extend beyond April 1, 1906.

The Harris Machinery Company, Minneapolis, Minn., which has been conducted as a copartnership for two years, was recently incorporated with a capital stock of $100,000. The company's business consists largely of dealing in and repairing engines, boilers and machinery of all kinds. A large stock of new and second-hand equipment is carried on hand at all times. Officers of the company are Bernhard S. Harris, president; Marks Harris, vice-president, and Arthur M. Harris, secretary and treasurer.

The Bessemer Foundry & Machine Company, Bessemer, Ala., has doubled its capacity.

The Yorke Furniture Company, Concord, N. C., whose plant was recently destroyed by fire, has not yet purchased the new machinery it will require, and is in the market for wood working machinery, blower system, belting, shafting, pulleys, &c. No engines or boilers are required. The company has about ten carloads of scrap for sale.

C. F. Groenke & Son, Everett, Wash., have purchased a site at Chehalis, where they will move their foundry and machine shop as soon as the necessary buildings can be erected.

The Detrick & Harvey Machine Company, Baltimore, Md., has commenced work upon an addition to its shop, ground for which was recently purchased.

The Robb-Mumford Boiler Company, South Framingham, Mass., has installed four electric traveling cranes and riveter hoists manufactured by Northern Engineering Works, Detroit, Mich.; one of 25 tons capacity, 50 feet span, four-motor design; one 5-ton, 28 feet span, three-motor, and two electric riveter cranes of 20 and 25 tons capacity with 50 feet lift.

The Robins Conveying Belt Company, New York, has recently secured an order from B. Altman & Co., New York, for conveyors for handling packages at their new store on Fifth avenue. One of the requirements of this conveyor system is that it will be operated without the least noise. Among other work that the Robins company now has on hand is an order for a large system of conveyors for the Caucasus Copper Company, Russia, and an order from the Bethlehem Steel Company for a belt conveyor for handling sand at its foundry at South Bethlehem, Pa.

The Norwalk Iron Works Company, South Norwalk, Conn., manufacturer of air and gas compressors, has completed an addition to its pattern department, consisting of a third floor to an existing building, 23 x 65 feet.

The Climax Machinery Company, Indianapolis, Ind., has been incorporated with a capital stock of $150,000. The company will conduct a general machine shop and manufacturing business, making a specialty of a line of threshing machine attachments, and expects to be in business by February 1. Incorporators are: Chester Bradford, James E. Lilly, R. B. Hilleary, George W. Faris, Arthur A. McKain, Theophilus King and Charles E. Sloan.

Shipments made recently by the H. A. Stocker Machinery Company, Chicago, include two 36 x 36 inch by 10 foot frog and switch planers to the Morden Frog & Crossing Company, Chicago; one 38 x 42 inch by 16 foot frog and switch planer (Flather make) to the Buda Foundry & Machine Company,

Harvey, Ill.; machine shop outfit to Oconto Falls Machine Company, Oconto Falls, Wis.; machine shop outfit to the Automatic Recording Company.

The Kempsmith Mfg. Company, Milwaukee, Wis., on account of excessive demand for its new improved types of milling machines, is adding thousands of dollars' worth of new equipment to its shops, and is rapidly pushing work on a two-story addition, 45 x 75 feet. The company is also installing a new Corliss engine which will give double the former power capacity.

The Driggs-Seabury Ordnance Corporation, Sharon, Pa., is finishing a new 6-inch rapid fire gun which will be taken to the Government proving ground at Indian Head, near Washington, D. C., for an official test. It is a new type and will be placed in competition with other makes.

Power Plant Equipment.

The Murray Iron Works, Burlington, Iowa, has received an order from the Burgess-Norton Mfg. Company, Geneva, Ill., for a 100 horse-power steam power plant.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has received a contract for a large amount of electrical equipment to be installed in the first of the nine hydro-electric plants to be built on the Catawba River in North Carolina by the Southern Power Company, for generating electrical energy for operating cotton mills. The initial plant will have a capacity of 40,000 horse-power and will be erected at Great Falls, near Charlotte, N. C.

The report that the Sligo Iron & Steel Company, Connellsville, Pa., was installing a large electrical plant for the handling of materials is officially denied. It is possible that such equipment may be put in by this concern at a future date, but the matter has not been definitely settled.

The Great Lakes Engineering Works, Detroit, Mich., has recently ordered 19 more of the American Blower Company's self oiling engines, type A. These are to be used in connection with ash hoists and forced and induced draft plants on boats now building. These orders are placed after very thorough tests of engines of this type in various capacities during the past season.

C. J. Humphreys, secretary of the Board of Improvements, Argenta, Ark., will receive bids until January 15 for the construction of water works and electric plant. Two 500 horse-power water tube boilers, two 225 horse-power Corliss engines, two 140-kw. alternating current generators, two 1,000,000-gallon compound duplex pumps, two boiler feed pumps, one feed water heater and other supplies are required.

The firm of T. B. Wood's Sons, Chambersburg, Pa., has been succeeded by the T. B. Wood's Sons Company, incorporated with a capital stock of $240,000. The new company will continue under the same general management the manufacture of a complete line of modern appliances for the transmission of power. George A. Wood is president; Theodore M. Wood, vice-president; William H. Fisher, secretary, and Charles O. Wood, treasurer.

The management of the United Verde Copper Mine at Jerome, Ariz., has just contracted with the Ingersoll-Rand Company, New York, for a cross-compound condensing two-stage Corliss air compressor which, when installed, will be the largest compressor unit in Arizona and the Southwest. The order calls for a 48-inch stroke machine, with steam cylinders 28 and 52 inches in diameter and air cylinders 44¼ and 26¼ inches. Steam cylinders are jacketed, with valves in the heads. The machine is to operate under 110 pounds steam pressure and a vacuum of 20 inches; a very high steam economy is guaranteed. The air cylinders will be jacketed on heads and barrels and will be fitted with the piston inlet air valves. The compressor will run at 75 revolutions per minute, at which the piston displacement will be 6060 cubic feet of free air per minute. The air pressure is to be 100 pounds and the altitude is about 5500 feet.

James E. McNary, manager of the Pittsburgh office of the Hoover-Owens-Rentschler Company, Hamilton, Ohio, maker of Hamilton Corliss engines, has recently sold one 20 x 36 inch heavy duty engine to the Kittanning Brick & Fire Clay Company, Kittanning, Pa.; one 34 x 48 inch heavy duty mill engine to the Spang, Chalfant Company, Pittsburgh, to be used in its Etna Iron & Tube Works. The concern has also sold the 36 x 68 x 54 inch cross compound vertical engine that it exhibited at the Louisiana Purchase Exposition, at St. Louis, in 1904, to the Pittsburgh Plate Glass Company, Pittsburgh, Pa.

Foundries.

The new Milwaukee School of Trades has under consideration the addition of a small foundry to the school.

The Mesta Machine Company has through its New York office, 85 Liberty street, secured the order for furnishing the Passaic Steel Company, Paterson, N. J., during 1906 with all its cast steel rolls, rolling wheel pinions, coupling boxes and spindles.

The Western Steel & Foundry Company is to double the capacity of its malleable iron foundry at Anniston, Ala.

The Lake Superior Corporation will erect an open hearth steel plant at its works at Sault Ste. Marie, Ont.

The S. Obermayer Company, through its New York office, has secured the contract for the complete equipment of the new brass foundry to be started by the Fire Department of New York.

The Household Foundry Company, Providence, R. I., has taken the old established foundry of the Household Sewing Machine Company and will continue the general foundry business, making every variety of gray iron castings, in loam, dry and green sand; also all kinds of castings in yellow brass, composition, phosphor-bronze and aluminum. In connection with the foundry the company will have case hardening and annealing departments. James E. Dick, late superintendent of the Whittier Machine Company's foundry, South Boston, will be the general manager.

Williams & Owens, proprietors of the Twin City Job Foundry, Sterling, Ill., have closed a contract with a large manufacturing company in Chicago for furnishing castings to the amount of $5,000. The firm has several other contracts on hand and will immediately take steps to enlarge its foundry.

The Buhl Malleable Company, Detroit, Mich., is increasing its equipment by the installation of a 20-ton furnace in one of the buildings of the plant now undergoing repairs.

The Weatherly Foundry & Machine Company, Weatherly, Pa., has increased the capital stock from $35,000 to $50,000.

The business of Lundin & Munro, doing business as the Tool Steel Casting Company, Boston, has been incorporated in Massachusetts as the Lundin Steel Casting Company, with a capital stock of $25,000. The officers are: President, A. G. Lundin; treasurer, William A. Thibodeau; directors, these officers and E. M. Hoelscher. The company's factory is on Clark avenue, Chelsea, Mass., and the office at 6 Beacon street, Boston. The company will make a specialty of crucible steel castings. It is not at present in the market for machinery or supplies.

The Standard Pulley Company, Cincinnati, Ohio, is planning the erection of a foundry and machine shop on Spring Grove avenue. Details are not yet available.

Bridges and Buildings.

The Terry & Tench Company, New York, has been awarded the contract for the construction of several bridges for the New York, Westchester & Boston Railway. It is understood that about 4000 tons of steel will be used in the work.

The Strobel Steel Construction Company, Chicago, offered the lowest bid for the construction of section No. 1 of the superstructure of the Washington avenue viaduct at Milwaukee. The company's bid was $91,510. The section to be built is 851 feet long and is about one-third of the entire viaduct.

Marshall Field & Co., Chicago, will immediately begin the construction of a handsome mercantile building at the northeast corner of State and Washington streets, thus completing the entire frontage from Washington street north to Randolph, a distance of 385½ feet with a granite structure fifteen stories high, having frontages of 150½ feet respectively on Washington and Randolph streets. The estimated cost of this new section is $1,500,000. D. H. Burnham & Co. are architects in charge of the work. The new building when completed will give to the retail store for merchandising a floor space area of 1,500,000 square feet, or about 33 acres.

William B. Scaife & Sons Company, Pittsburgh, Pa., has received the contract for the structural steel work for the new building of the Southern Bell Telephone Company, Atlanta, Ga. A considerable tonnage of steel will be required for the work.

Fires.

The tannery plant of the Hancock Leather Company, Riceville, Me., was recently destroyed by fire, with a loss of $45,000.

The Portland Railroad Company's repair shop at Westbrook, Me., was burned last week. Loss is about $8000.

A recent fire did $10,000 damage to the De Kalb Iron Works, Auburn, Ind.

The New Haven Clock Company, New Haven, Conn., suffered its second serious fire within a few days December 27, the clock movement department being seriously damaged, with estimated loss of $30,000.

Hardware.

By the reorganization of the Colfax Mfg. Company, South Bend, Ind., January 2, the controlling interest of the capital stock of the company was transferred to the younger members of the Studebaker Bros. Mfg. Company of South Bend. The new organization will be continued under the former name and will be controlled and owned by the following officers and stockholders: Nelson J. Riley, president; Lloyd F. Weaver, vice-president; Frederick M. Pitner, treasurer and general manager; Charles Arthur Carlisle, secretary; Col. Geo. M. Studebaker, H. D. Johnson, J. M. Studebaker, Jr., E. L. Kuhns and Schuyler Colfax, directors; Clement Studebaker, Jr., F. S. Fish and W. R. Innis. Improved manufacturing facilities have already been assured and the new organization will shortly move from its present location and will, by February 1st, be ready to enter upon an aggressive campaign, a large number of orders having already been placed for domestic and foreign shipment.

The Sheboygan Sash Lock Company, Sheboygan, Wis., has filed an amendment changing the name of the incorporation to the Diehl Novelty Company. Jacob Diehl is president and W. E. Tallmadge secretary.

Smith & Dorsett, 405 East Forty-seventh street, New York City, have incorporated their skylight and roofing business under the style of Smith & Dorsett Company.

PERSONAL.

W. R. Warner of the Warner & Swasey Company, Cleveland, in a paper read before Section C of the American Association for the Advancement of Science at New Orleans last week, referred to the sea level plan for the Panama Canal as the only one the Government ought to adopt. Mr. Warner accompanied the Congressional Committee that visited the Isthmus of Panama one year ago.

M. Andrews, who has for some time been in charge of the dock and vessel interests of M. A. Hanna & Co., Cleveland, has been admitted to partnership in the firm. The interests of the estate of Senator Hanna have been withdrawn recently, except those of his son, D. R. Hanna, who is the head of the firm.

Charles C. Tyler, for the past two years connected with the Allis-Chalmers Company as general superintendent, became master of works at the National Cash Register Company's plant, Dayton, Ohio, on January 1.

Russell G. Backus, heretofore in the Cleveland office of the International Steam Pump Company, has entered the employ of the Jeansville Iron Works, Jeansville, Pa., and will be in charge of the turbine pump department.

R. T. Crane, president of the Crane Company, Chicago, has gone to Pasadena, Cal. Mr. Crane spends the winters regularly in southern California, remaining there from two to three months.

Henry Penton has resigned as chief engineer of the Great Lakes Engineering Works, Detroit, desiring a change of occupation in view of his recent severe illness. George Mattson, who for many years was associated with Frank E. Kirby at the Detroit Shipbuilding Company's plant, has been appointed chief engineer of the marine engineering department, in charge of engines, boilers and designing. George Henderson, recently resigned from the Detroit Shipbuilding Company, has been made superintendent of the construction and repair work at the Great Lakes Engineering Works engine plant. In the hull department at the Ecorse and St. Clair yards, John A. Ubsdell, Jr., will be in charge of designing and construction.

A. Eugene Michel has resigned as assistant advertising manager of the Standard Paint Company and is now with the Geo. H. Gibson Company, advertising, Park Row Building, New York City. Since graduating from Rose Polytechnic Institute Mr. Michel has been in the engineering department of the Diamond Chain Works of the Federal Mfg. Company, the testing department of the Ewart Mfg. Company and the publicity department of the International Steam Pump Company.

F. I. Freeman, formerly connected with the George A. Hogg Iron & Steel Foundry Company, Pittsburgh, has been appointed general superintendent of the Vulcan Foundry & Machine Company, Pittsburgh, whose works are at New Castle, Pa.

F. A. Carter, who has been with the Morgan Engineering Company for the past 25 years, has severed his connection with that company and accepted a position with the Alliance Machine Company, Alliance, Ohio, as manager of the sales department.

Charles G. Washburn, Worcester, Mass., has been elected president of the Board of Trustees of the Worcester Polytechnic Institute, succeeding the late Stephen Salisbury. Mr. Washburn has been a trustee of the institute for many years and until his election as president was treasurer of the board. He is prominent as a patent attorney and as a manufacturer, being an officer of the Wire Goods Company, Worcester, and formerly of the Washburn & Moen Mfg. Company, and later of the Washburn Wire Company.

H. Luermann, the well-known metallurgist of Berlin, Germany, was awarded the first Karl Lueg medal recently established by the Verein deutscher Eisenhuettenleute.

Henry C. Ebert, assistant to the third vice-president of the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., has resigned his position to become the president of the Cincinnati Car Company and vice-president of the Ohio Tractions Company. Mr. Ebert's Westinghouse connection dates back about 15 years. It was while he occupied the position of superintendent of construction that the ten 5000 horse-power revolving field generators made by the Westinghouse Company were installed and put in operation in the power plant of the Niagara Falls Power Company. The officers of the Westinghouse Electric & Mfg. Company gave a dinner in his honor at the Hotel Schenley just before he left, and as a token of their esteem he was presented with a bronze electric stand lamp.

William E. Sherlock has retired from the presidency of the Novelty Iron Company, manufacturer of steam heating apparatus, Canton, Ohio, and his successor is Henry E. Sherlock, formerly secretary and treasurer.

B. M. Whitlock has resigned as vice-president and general manager of the National Steel & Wire Company to accept the presidency of the Guanacevi Tunnel Company, to devote more time to the large interests in Mexico represented by Whitlock & Hall, 25 Broad street, New York.

George A. Baird, vice-president and general sales agent of the Republic Iron & Steel Company, has resigned, to take effect at the pleasure of the directors. The reason is that he will be unable to give attention to the affairs of the company after the removal of its general offices from Chicago to Pittsburgh. This change, which was announced some time ago, will probably take place about April 1.

W. I. Babcock, well known on the lakes as general manager for a number of years of the Chicago Shipbuilding Company, has been appointed New York representative of the Bath Iron Works, Bath, Maine. He is also connected with the Sub-Surface Torpedo Boat Company of New York.

John Birkinbine, the well known engineer of Philadelphia, has been once more nominated for the presidency of the Franklin Institute, an office which he has filled for several terms. Mr. Birkinbine has given the famous old institution years of unselfish and successful labors.

The United Engineering Society.—At a meeting of the Board of Directors of the American Institute of Electrical Engineers December 15, John W. Lieb, Jr., was appointed trustee to represent the institute for a term of three years upon the Board of Trustees of the United Engineering Society invested with the care and administration of the new United Engineering Building. Mr. Lieb at the same time was made a representative of the institute on the Building Committee. He succeeds Dr. Schuyler Skaats Wheeler, who by reason of his recent election to the presidency of the institute resigns from these other bodies. The representation of the institute therefore after the annual meeting of the United Engineering Society in January will consist of Charles F. Scott, Bion J. Arnold and John W. Lieb, Jr., who are past presidents of the institute in the order named. Work on the building is in active progress, and it is expected to lay the cornerstone early in the spring.

An amusing error is made in an article entitled "How Men Get Rich," in the January issue of *World's Work*. The foundation of some of the fortunes made in the tin plate trade is alleged to have been laid in the development of tin mines in Indiana. The author either jumped at conclusions or is the victim of a wicked joker. All the tin thus far produced in the United States from the beginning of time would not meet the requirements of the Indiana tin plate mills for one month.

On December 30 there were shipped from the Vandergrift (Pa.) works of the American Sheet & Tin Plate Company 1661 gross tons of black and galvanized sheets. This is the largest day's shipment in the history of this plant and is certainly a credit to the management of the mill.

The Baker iron mine, near Dover, N. J., which was recently opened after being idle for a number of years, caved in Saturday morning. The ore docks and power house were carried away.

The Iron and Metal Trades

The principal event of the week has been the advance in prices on the greater part of all the lighter finished products. It amounts to $2 per ton on Box Annealed Sheets, $1 per ton on Blue Annealed Sheets, $2 per ton on Galvanized Sheets, 10c. a box on Tin Plate, 10c. a square on Galvanized Roofing and $1 per ton on Wire products.

There are further indications of a revival of buying of Pig Iron, although the movement is not yet quite general. Cleveland reports sales aggregating 25,000 tons, mostly Foundry Iron, for delivery during the first half. Cincinnati notes that Pipe shops in the district have taken heavy tonnage, one of them placing 22,500 tons, while others are in the market. Some demand for Basic and Bessemer Pig has also cropped up in the Central West. In Eastern Pennsylvania sales of Basic Pig during the week figure up to fully 80,000 tons, which includes about 30,000 tons taken for the Pencoyd Works for the first half of the year.

How great the activity during the past year has been is reflected well by the figures of production of the United States Steel Corporation. During 1905 the output of the blast furnaces of the constituent companies aggregated 10,175,505 gross tons, as compared with 7,975,530 gross tons in 1902, the previous record year. The production of Steel Ingots reached the enormous total of 11,995,205 gross tons, as compared with 9,743,918 tons in the record year of 1902.

It may be interesting to add that there have just been authorized extensions and improvements in plants by the Corporation which will add very close to 1,000,000 gross tons of Pig Iron, about 535,000 tons of Steel Ingots and over 760,000 tons of Finished Iron and Steel to the annual capacity. This is exclusive of the enormous plant which is planned for the Chicago district.

The output of coke and anthracite Pig Iron in December is shown by reports of production gathered by *The Iron Age* to have gained only 37,000 gross tons on that of November. The December production was 2,052,397 tons. Being a 31 day month, the output should have been larger. The production, however, was checked by the blowing out of furnaces for repairs and by banking for the holidays. January starts a weekly capacity for active coke and anthracite furnaces of only 466,302 tons against 475,814 tons December 1.

In the heavy trades there has been no very pronounced movement. Among the Rail sales we note 21,000 tons for the M., K. & T. road, 5,000 tons additional for the Wabash, 3,000 tons for the Chesapeake & Ohio, and an aggregate of 15,000 tons since the opening of the year for trolley roads, etc.

No very large contracts have been closed in Structural Material. Of the total of 25,000 tons of Bridge work for the Tidewater Railroad, only 5,000 tons have been awarded to a Virginia bridge shop, the balance being still open.

The Cast-Iron Pipe industry is exceedingly busy. Philadelphia carried off the 30,000 ton order for the high pressure service for the city. Another contract closed was 8000 tons for the gas interest in this city, with further purchases pending. The Philadelphia Gas Company has also bought largely. It is expected that the Department of Water Supply of this city will shortly call for bids for 48-inch Pipe. The quantity may be in excess of 25,000 tons.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 10, 1906.	Jan. 3, 1906.	Dec. 13, 1905.	Jan. 11, 1905.
PIG IRON:				
Foundry No. 2 Standard, Philadelphia	**$18.50**	$18.50	$18.25	$17.50
Foundry No. 2 Southern, Cincinnati	16.75	16.75	16.75	16.25
Foundry No. 2, Local, Chicago	19.25	19.25	19.25	17.50
Bessemer, Pittsburgh	18.35	18.35	18.35	16.85
Gray Forge, Pittsburgh	**17.25**	17.25	17.10	16.25
Lake Superior Charcoal, Chicago	**20.50**	20.00	20.00	18.50
BILLETS, RAILS, &c.:				
Bessemer Billets, Pittsburgh	26.00	26.00	26.00	23.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	25.00
Open Hearth Billets, Phila	30.00	30.00	30.00	....
Wire Rods, Pittsburgh	**34.00**	33.00	32.50	31.00
Steel Rails, Heavy, Eastern Mill	28.00	26.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	16.50	16.50	16.50	16.00
O. Steel Rails, Philadelphia	18.25	18.25	18.25	17.75
O. Iron Rails, Chicago	23.00	23.00	23.00	21.00
O. Iron Rails, Philadelphia	24.50	24.50	24.50	22.50
O. Car Wheels, Chicago	19.00	19.00	19.00	16.50
O. Car Wheels, Philadelphia	**18.75**	18.75	17.50	16.00
Heavy Steel Scrap, Pittsburgh	17.50	17.50	17.50	16.50
Heavy Steel Scrap, Chicago	*15.00*	15.00	15.25	15.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.83½	1.93½	1.83½	1.65
Common Iron Bars, Chicago	1.85	1.85	1.85	1.65
Common Iron Bars, Pittsburgh	1.90	1.90	1.90	1.69¾
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.54½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.40
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.64½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.50
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.64½
Beams, Pittsburgh	1.70	1.70	1.70	1.50
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.64½
Angles, Pittsburgh	1.70	1.70	1.70	1.50
Skelp, Grooved Steel, Pittsburgh	1.55	1.55	1.55	1.45
Skelp, Sheared Steel, Pittsburgh	1.65	1.65	1.65	1.50
SHEETS, NAILS AND WIRE:				
Sheets, No. 27, Pittsburgh	**2.30**	2.20	2.20	2.20
Wire Nails, Pittsburgh	**1.85**	1.85	1.80	1.75
Cut Nails, Pittsburgh	**1.75**	1.75	1.70	1.75
Barb Wire, Galv., Pittsburgh	**2.30**	2.30	2.25	2.20
METALS:				
Copper, New York	19.00	19.25	19.00	15.12½
Spelter, St. Louis	**6.45**	6.50	6.40	6.15
Lead, New York	*5.95*	5.95	6.00	4.60
Lead, St. Louis	**6.00**	5.90	5.75	4.52½
Tin, New York	**36.50**	36.05	36.00	29.05
Antimony, Hallett, New York	**14.25**	13.75	13.00	8.75
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	**3.69**	3.59	3.59	3.74

Chicago.

FISHER BUILDING, January 10, 1906.—(*By Telegraph.*)

An avalanche of specifications, accumulated during the holiday season and stocktaking period, reached the Western mills this week, and the congestion, which was somewhat relieved during December, is now greater than ever. Finishing mills generally are not promising deliveries before July, and on Rails and Track Materials deliveries cannot be promised before November. With heavy requirements in many finished lines yet unplaced, a shortage of material is foreshadowed with the increased consumption that sets in with the advent of the spring months. Numerous advances on the more highly finished lines became effective on Monday and include $1 per ton on Wire products, $2 on Box Annealed Black Sheets, $1 on Blue Annealed, $2 on Galvanized Sheets, 10c. per square on Galvanized Roofing, 10c. a box on Tin Plate, $2 per ton on Spikes, and 50c. per ton on Light Rails. In view of the high prices that have been prevailing on the semifinished materials used in the manufacture of Wire, Sheets and Tin Plate, these advances are considered very conservative, and still do not increase the spread between the raw material and the finished product sufficiently to net the independent manufacturer a fair profit. The only Rail contract of importance closed this week specified 2500 tons for an electric road. Municipal lettings of Cast Iron Pipe in the Northwest aggregate nearly 4000 tons for St. Paul, Minneapolis and Bismarck, while the city of St. Louis will next week close for 4000 tons for spring delivery.

Pig Iron.—On account of the car shortage in the South deliveries of Southern grades are from 30 to 60 days behind, and one large interest has accumulated a stock of 40,000

tons in the last two months on account of the inadequate shipping facilities. The shortage of Southern iron in this market is acute and prompt deliveries readily command premiums of 50c. per ton. On the other hand, the market is easier on forward shipments, and one large interest that has been quoting $15, Birmingham, on No. 2 reduced its schedule 50c. this week. While $14.25 is not openly quoted, it can nevertheless readily be done, although this represents the market's minimum. On January 1 freight rates from Virginia furnaces were advanced 20c. per ton, from $2.65 to $2.85, and on March 1 the rate from Southern furnaces will be increased 25c., from $3.65 to $3.90, for Chicago delivery. These increased freight charges will of course be paid by the consumers, as all the contracts closed last fall covered this contingency. The Pig Iron demand is limited almost entirely to small lots for prompt delivery, although inquiries aggregating 8000 tons came out within the past few days. A shortage of High Silicon Iron already exists and higher prices are anticipated in the near future. We quote at Chicago as follows:

Lake Superior Charcoal	$20.50 to $21.50
Northern Coke Foundry, No. 1	19.75 to 20.00
Northern Coke Foundry, No. 2	19.25 to 19.50
Northern Coke Foundry, No. 3	18.75 to 19.00
Northern Scotch, No. 1	20.00 to 20.50
Ohio Strong Softeners, No. 1	20.05 to 20.30
Ohio Strong Softeners, No. 2	19.55 to 19.80
Southern Coke, No. 1	18.65
Southern Coke, No. 2	18.15
Southern Coke, No. 3	17.65
Southern Coke, No. 4	17.15
Southern Coke, No. 1 Soft	18.65
Southern Coke, No. 2 Soft	18.15
Southern Gray Forge and Mottled	16.65
Malleable Bessemer	19.50 to 20.00
Standard Bessemer	19.30 to 19.55
Jackson Co. and Kentucky Silvery, 6 %	21.30
Jackson Co. and Kentucky Silvery, 8 %	22.30
Jackson Co. and Kentucky Silvery, 10 %	24.30

Metals.—On Monday another advance of 25c. became effective on Sheet Zinc and Lead was similarly advanced. Trading in Copper in this market has fallen off materially since the first of the year and consumers are determined to await lower values. We quote: Casting Copper, 21c. to 21½c.; Lake, 21½c. to 22c.; Pig Tin, car lots, 38c. to 38½c.; small lots, 39c. to 40c.; Spelter, prompt delivery, 6¾c. to 7c. for car lots; Lead, Desilverized, 6.35c. to 6.50c.; Corroding, 6.80c. to 7c. for 50-ton lots; on car lots, 2¼c. per 100 lbs. higher; Sheet Zinc is $8 list, f.o.b. Lasalle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 16¾c.; Heavy Copper, 16¼c.; Copper Bottoms, 15½c.; Copper Clips, 16¼c.; Red Brass, 15¼c.; Red Brass Borings, 13¼c.; Yellow Brass, Heavy, 12¼c.; Yellow Brass Borings, 10¼c.; Light Brass, 8½c.; Lead Pipe, 5¼c.; Tea Lead, 4¾c.; Zinc, 5c.; Pewter, No. 1, 22c.; Tin Foil, 29c.; Block Tin Pipe, 27½c.

Sheets.—Effective January 8, Black and Galvanized Sheets were advanced $2 a ton, which makes the base price of No. 28 Black Sheets, box annealed, one pass through cold rolls, 2.56½c., Chicago. Blue Annealed Sheets were advanced $1, Galvanized Roofing 10c. per square and Tin Plate 10c. per box, while Black Plate was likewise advanced 10c. per 100 lbs. We quote in car lots from mill: Black Sheets, Blue Annealed, Nos. 9 and 10, 1.86½c. to 1.91½c.; Nos. 16 and 17, 2.06½c. to 2.11½c.; Box Annealed, Nos. 18 to 20, 2.26½c. to 2.31½c.; No. 27, 2.46½c. to 2.51½c.; No. 28, 2.56½c. to 2.61½c. Galvanized Sheets, Nos. 10 and 11, 2.46½c. to 2.51½c.; Nos. 17 to 21, 2.81½c. to 2.86½c.; No. 27, 3.36½c. to 3.41½c.; No. 28, 3.61½c. to 3.66½c. Black and Galvanized Sheets from store are quoted at an advance of 25c. to 50c. per 100 lbs. above mill prices.

(By Mail.)

Rods and Billets.—Wire Rods are scarce and none of the large mills is in position to make early shipments on new contracts. Bessemer Rods are quoted at $36, Chicago, and Basic are held at an advance of $1 a ton. Forging Billets in small lots continue to sell at $35, Chicago, but no contracts extending over any considerable period are now being closed by the leading interest.

Rails and Track Supplies.—The output of the mills and plants of the Illinois Steel Company producing Track Supplies has now been contracted for covering a period of ten months, and for the present at least this company is out of the market on Spikes and Bolts. Light Rails have also been sold heavily for future delivery and prices have again been advanced 50c. a ton. Spikes have been advanced $2 a ton and still higher prices are looked for in the immediate future. On Standard Section Rails the mill of this company has more than its output for 1906 already booked and while the production last year was well in excess of 700,000 tons, breaking the best previous record, it is probable that it will approximate 800,000 tons this year from present indications. The only new Rail tonnage taken on this week covered 2500 tons for an electric line. We revise quotations as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.10c.; Track Bolts, 2.55c. to 2.60c., base, Square Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, $27 to $28; 25 lb., $28 to $29; 20 lb., $29 to $30; 16 lb., $30 to $31; 12 lb., $31 to $32, and lighter sections down to 8 lb., $38 to $40, f.o.b. mill. Standard Sections are unchanged at $28, f.o.b. mill, full freight to destination.

Structural Material.—New buildings that are now being projected in the downtown district for erection this year already provide for the consumption of a large tonnage and the outlook is favorable to more building this year than last. The Steel for the addition to the Auditorium Hotel has already been placed with the Carnegie Steel Company, aggregating 2500 tons. Contract for the new county building, aggregating 11,000 tons, has not yet been awarded. Quotations on future shipments from mill are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼ inch and heavier, 1.86½c.; Angles, larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work.

Plates.—Plate specifications received this week by the Illinois Steel Company are almost double the capacity of the company's mills, and the heavy contracts placed during the closing days of last year have filled up the order books through the first six months. Quotations are unchanged as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch plates, tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange and head quality, 25c. extra.

Bars.—A wide range of prices continues to be quoted on Iron Bars, and while one interest is quoting 2c., as low as 1.80c. has been done during the week. New business in Steel Bars is comparatively light, although specifications on existing contracts continue to be received by the mills in large volume. Quotations are unchanged, as follows: Iron Bars, 1.85c. to 2c.; Steel Bars, 1.66½c., both half extras; Hoops, 2.01½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras, and Hard Steel Angles and Bars are now quoted on practically the same basis as Soft Steel. Store prices are as follows: Bar Iron, 2.20c. to 2.25c.; Soft Steel Rounds and Squares, 2 inches and larger, 2c., base; Flats, 2 and 4 inches by 1⅛ inch and thicker, 2c., base; Flats, 4½ x 5 inches and 6 x 5-16 inch and thicker, 2c.; all Ovals, Half Ovals and Half Rounds, 2c.; Steel Bands are held at a minimum of 1.95c. to 2c., half extras; Soft Steel Hoops, 2.30c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Pipe.—There is very little change in conditions and official prices are being fairly well maintained, not so much on account of the amount of tonnage that is offering as the high prices that are prevailing for Skelp. The market's minimum is represented by the following official discounts: Black Steel Pipe, 78.35 per cent. on the base sizes ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.

Boiler Tubes.—The market continues quiet and sales are limited almost entirely to small lots from jobbers' stocks. Official discounts, base sizes, in car lots, are as follows: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.35; 2½-inch and smaller and lengths over 18 feet, and 2¾-inch and lengths over 22 feet, 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—Several early lettings in the Northwestern territory are already under consideration. The city of Minneapolis will award contract this week for about 1500 tons and St. Paul will likewise close for about 1000 tons. The city of Bismarck, S. D., is in the market for 800 tons. In the South the largest letting under consideration is that of the city of St. Louis, amounting to 6500 tons, which will probably be closed next week. Quotations are unchanged, as follows: Water Pipe, 4-inch, $31; 6, 8, 10 and 12 inch, $30; over 12-inch, $29, with $1 extra for Gas Pipe. Large municipal contracts are usually placed at somewhat lower basis.

Merchant Steel.—While the new tonnage that is reaching the mills is comparatively light, specifications continue very heavy, and notwithstanding the tremendous consumption of all kinds of Agricultural Steel during the last quarter

of last year, the indications point to a continuation through the early months of 1906. Quotations are unchanged, as follows: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to 1½ x ½ inch, 1.65c., and Iron Finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 inch, 2c., and 1⅛ inch and larger, 1.90c., Pittsburgh; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount on car lots and 45 per cent. in less than car lots, in base territory.

Coke.—Heavy consignments of Connellsville Coke continue to come into this territory, and as a rule are disposed of at prices which net the shippers from $3.25 to $3.35. The weather conditions continue very favorable for the movement of Coke from both the Connellsville and Virginia fields, and many consumers are availing themselves of the opportunity now offered to secure this prompt material at low prices. On contracts running through the first half of the year $3.50 is practically the minimum, equivalent to $6.15, Chicago, while on by product Coke as high as $6.40 has been secured.

Old Material.—The market has been unusually quiet, and sales have been largely limited to transactions among dealers, as most of the consumers covered their requirements some time ago. The Rock Island is the only railroad list of importance that has been issued thus far this year, and it only disposes of a very small tonnage. On account of the weakness displayed in practically all lines the railroads are temporarily holding off, and it is probable that no large lists will be sent the trade until the market shows an advancing tendency. The range of prices paid by large consumers to producers and dealers, car lots, f.o.b. Chicago, is as follows:

Old Iron Rails	$23.00 to $23.50
Old Steel Rails, 4 feet and over	16.50 to 17.00
Old Steel Rails, less than 4 feet	16.50 to 17.00
Heavy Relaying Rails, subject to inspection	26.50 to 27.00
Old Car Wheels	19.00 to 19.50
Heavy Melting Steel Scrap	15.00 to 15.25
Frogs, Switches and Guards	15.00 to 15.50
Mixed Steel	13.00 to 13.25

The following quotations are per net ton:

Iron Fish Plates	$20.00 to $20.50
Iron Car Axles	23.50 to 24.00
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	18.00 to 18.50
No. 2 Railroad Wrought	17.00 to 17.50
Locomotive Tires, smooth	14.25 to 14.50
Railway Springs	15.00 to 15.50
No. 1 Dealers' Forge	13.50 to 14.00
Wrought Pipes and Flues	12.50 to 13.00
Mixed Busheling	12.50 to 13.00
Iron Axle Turnings	12.50 to 13.00
Soft Steel Axle Turnings	12.50 to 13.00
Machine Shop Turnings	12.00 to 12.50
Cast Borings	10.00 to 10.50
Mixed Borings, &c	9.75 to 10.00
No. 1 Mill	10.00 to 10.50
Country Sheet	9.00 to 9.25
No. 1 Boilers, cut to Sheets and Rings	12.00 to 12.50
No. 1 Cast Scrap	15.00 to 15.50
Stove Plate and Light Cast Scrap	12.00 to 12.50
Railroad Malleable	15.00 to 15.50
Agricultural Malleable	14.50 to 15.00

Philadelphia.

REAL ESTATE TRUST BUILDING, January 9, 1906.

The first week in the new year developed an amount of business which certainly beats the record. Around the holiday times there is usually a period of inactivity, but this year buyers seem to have disregarded the season and commenced covering their requirements without waiting to see if lower prices could be had. This is indubitable evidence, not only of confidence in values but of an extraordinary large amount of work that must be got out within the next few months. Naturally the buyers are not expecting lower prices, but they are willing to take their chances on ruling quotations, which are no doubt entirely safe and may prove to be very advantageous later on. Finished products are relatively less buyoant than the crude materials, although they are not weak, neither are they inactive, but there is not the strong front that might be expected considering the favorable conditions in other directions. There is no scarcity of work, however. Some are full for several months to come. Others could make deliveries inside of 30 days, but these are the smaller class of mills, which make it a point to look more to day to day trade than to tie up with long contracts. The impression seems to be that while there will be an unprecedented amount of business during the first half of the year it will be taken care of without any unusual strain and that prices are not likely to move very far from their present level. The increase in the capacity for production has been so large that we can perhaps produce 28,000,000 to 30,000,000 tons of Pig Iron during the year, and it is highly probable that consumption will be well within the limits named, so that there will not be much danger of inflation in values. Costs will be higher, and to that extent prices must be in proportion, but the era of wide fluctuations in prices is probably a thing of the past.

Pig Iron.—The year begins with unusual activity and gives promise of being one of the best on record. Sales during the past two weeks have been surprisingly large, indicating that consumers have an immense amount of work on their books and are purchasing accordingly. Prices are only slightly better, but there is a disposition to keep the market under good control and to avoid everything that savors of inflation. The heaviest end of the business has been in Basic Iron at prices ranging from $17.75 to $17.90, delivered, according to date, the total tonnage being around 80,000 tons. A considerable quantity of metal for the Pipe foundries and also for rolling mill purposes was taken at prices varying from $17 to $17.50, delivered. No. 2 X Foundry has been less conspicuous, but a full average business has been done at prices averaging about $18.50, delivered. The situation appears to be very strong, but there is no great probability that prices will vary to any appreciable extent from the rates now ruling. The output is very large and is expected to be still larger in the near future, so that there is at least reasonable assurance of ample supplies. The change in the weather may make some difference, but conditions were so favorable until within the past day or two that the danger of a shortage is sensibly decreased. Consumption keeps up to its highest limits, however, so that an output of approximately 2,500,000 tons per month will be necessary to meet current requirements. With so large an output it is of considerable significance to note that the question is not one of oversupply, but rather whether it will be large enough to keep everything going. To-day's prices for Philadelphia and nearby deliveries are about as follows:

No. 1 X Foundry	$19.00 to $19.50
No. 2 X Foundry	18.50 to 18.75
No. 2 Plain	17.75 to 18.25
No. 2 Southern	18.75 to 19.00
Standard Gray Forge	17.00 to 17.50
Basic	17.75 to 18.00
Low Phosphorus	24.00 to 24.50
Bessemer	19.50 to 19.75
Malleable Iron	19.00 to 19.25

Steel Making Alloys.—The situation appears to be a little easier, owing to fairly good arrivals, but there is still a great scramble for deliveries during the next three or four months. Prices cannot be given with any exactness, but they are probably a shade easier for the last half of the year, say $110 to $120 for 80 per cent. Ferromanganese for the first half and $80 to $85 for the last half.

Steel.—There is a good demand at about $30 delivered for the general run of orders and from that to $40 for special qualities.

Plates.—There is the usual good demand for Plates and in some cases a couple of dollars per ton premium has to be paid for satisfactory deliveries. The large mills are crowded with work, probably all they can turn out within the next four months, although some of the smaller mills are in a position to give fairly prompt deliveries. Prices are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100
3-16-inch thick	$0.10 pounds extra.
Nos. 7 and 8, B. W. G	.15 "
No. 9, B. W. G	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—There is no special feature in this department. In some cases deliveries are not as hard to get as they were some time ago, but there is an abundance of work and a large business for months to come is assured beyond question. Prices unchanged—namely, Beams, Channels and Angles, 1.83½c. to 2c.

Bars.—The demand for Bars is only fair. Mills are kept busy on old orders, but new business does not come in as appears to have been expected; neither are prices quite so strong as could be desired. The attempt to establish an advance has not met with any great success, and orders for carload lots are readily taken at 1.83½c., delivered. A meeting of the Eastern Bar Iron Manufacturers' Association is to be held in the course of the week, when it is possible that some action will be taken in regard to the situation.

Sheets.—The demand is very good, and an advance of $2 per ton is announced. Quotations are as follows for large lots, with the usual differential on less than carload lots: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c., and No. 28, 2.80c.

Old Material.—It is impossible to quote exact figures or to define the probable course of the market in the near fu-

ture. The general situation is strong, but the mills in this district are almost all embargoed, so that they are naturally not buying much at this time. Odd lots are taken when prices are attractive, but holders are very confident and unless for something that must be moved at once they hold for pretty full prices, the range being about as follows for deliveries in buyers' yards:

Scrap Steel Rails	$18.25 to $18.50
No. 1 Steel Scrap	17.50 to 18.00
Low Phosphorus Scrap	23.50 to 24.00
Old Steel Axles	21.50 to 22.50
Old Iron Axles	27.50 to 28.00
Old Iron Rails	24.50 to 25.00
Old Car Wheels	18.75 to 19.50
Choice Scrap, R. R. No. 1 Wrought	21.50 to 22.00
No. 1 Yard Scrap	19.50 to 20.00
Long and Short	18.00 to 19.00
Machinery Scrap	16.00 to 16.50
Wrought Iron Pipe	16.00 to 16.50
No. 1 Forge Fire Scrap	16.00 to 16.50
No. 2 Light Ordinary	12.50 to 13.00
Wrought Turnings	14.50 to 15.00
Axle Turnings, Choice Heavy	15.50 to 16.00
Cast Borings	11.00 to 11.25
Stove Plates	13.25 to 13.75
Grate Bars	12.75 to 13.25

The Chicago office of the Crucible Steel Company of America has been temporarily removed to the second floor of the Edgcomb Building, at the corner of Clinton and Washington street, pending the rebuilding of the present warehouse at 64 and 66 South Clinton street. A three-story modern office and warehouse will be built on the site of the old quarters. R. Michener is Chicago manager of this company.

Cleveland.

CLEVELAND, OHIO, January 9, 1906.

Iron Ore.—A number of furnaces are beginning to buy small amounts of Ore off the dock to piece out their needs. It is evident that this buying cannot be heavy, since it is estimated by officials of the Ore Association that not to exceed 1,000,000 tons of Ore was brought down during the season which was not sold before arrival at lower lake docks. On all Ore that is sold at the present time the 1906 prices are charged. This has been true since the determination of this year's prices. The Ore shippers take the position that since the furnaces are commanding higher prices for their Pig Iron they can afford to pay the 50c. advance in the price of Ore. In the case of Ore sales made last fall for piecing out, advances were made in some cases over the contract prices of 1905. Such advances were for the most part paid by buyers who found it necessary to piece out with Ores they had not been in the habit of using. Sales of small lots were made in the fall to regular customers, however, where Ore was available of the grades they had been using, at the prices paid at the beginning of the season. It is now said that many of the furnace interests in this territory have not covered their needs completely for this year. It is expected that the amount of Ore left on dock in the spring will be much smaller than heretofore. Stocks of Ore have been wiped out pretty generally, and the consumption has been keeping closer pace with receipts. It is hardly believed that the furnace stock piles, supplemented by the stocks on Lake Erie docks, with the Ore purchased on contracts for this year, will keep the furnaces going until July, 1907, and in consequence a stronger buying movement is expected a little later on. The estimated movement for this season is now between 36,000,000 and 37,000,000 tons. Prices remain on the basis of $4.25, f.o.b. Lake Erie docks for Old Range Bessemer, $4 for Mesaba Bessemer, $3.70 for Old Range non-Bessemer and $3.40 to $3.50 for Mesaba non-Bessemer, all the above prices being for base Ores.

Pig Iron.—Hubbard and River furnaces have blown out in the past ten days. The former went out because of an accident; the latter for repairs. Reports are that the inquiry for Foundry Iron in the past week has been the strongest in the winter season that has been seen in years. Buying also has been heavy. It is reported that close to 25,000 tons have been sold in this territory during the past week, while inquiries have been in lots ranging from 5000 to 10,000 tons. Most of this Iron is wanted for delivery during the first half of the year, although some of the inquiries call for delivery through the remainder of the year. There is some inclination on the part of buyers to try to break the market on long time contracts, but the furnaces so far have refused to make any concessions, the usual quotation being $18 at local furnace for No. 2 Foundry. There is very little spot Iron on the market, but it seems there is a good supply of Iron for second quarter delivery which is not yet under contract. A demand has sprung up for Basic and two or three orders have been reported during the week. The available supply for prompt shipment, however, has not been large. There is some Bessemer on the market, but it is expected the Steel Corporation will take this and the furnace interests are not uneasy over it. The Malleable Pig Iron trade is fairly strong. Prices hold at $17.50 in the Valleys for either spot shipment or forward delivery. A good deal of the Foundry Iron now being used comes from Southern stacks, which are still quoting $14.50, Birmingham. The Coke market is easier for the time being, owing to a better car supply, but the snowstorm which has swept over the Middle and Eastern States is expected to stiffen prices again. The best grades of 72-hour Foundry Coke are selling at $3.50 to $3.75 at the oven, and the best grades of Furnace Coke at $2.60 to $2.75 at the oven.

Finished Iron and Steel.—Mill reports are that all consumers having material unshipped at the expiration of their contracts January 1 have specified to the full amount of what remained on their orders. This means that none of the contracts will be allowed to lapse. This indicates the strength of the market over the year end and the brilliant prospects ahead. At the same time the mills make the announcement that contracts on hand will keep the mills employed through the better part of the first half of the year. On Monday the price of Light Sheets was advanced $2 a ton at the mill in view of the strong demand. During the period of active consumption in Sheets the market was dull. Now, when the trade is usually slack, the buying has been very heavy and continues to be so. The weak spots have not only been eliminated, but the market has shown a degree of strength not seen in two years. It is yet too early to see the effects of the advanced price, but the market is so strong it is hardly probable that buyers will rebel. Quotations on Sheets from stock have been advanced, although not as much as the mill price. Blue Annealed Sheets are marked up $1, while Box Annealed and Galvanized take the full $2 advance. This brings local quotations to 2.10c. for No. 10 Blue Annealed, 2.75c. for No. 28 One Pass Cold Rolled and 3.75c. for No. 28 Galvanized. The price of Plates was also marked up $2 a ton at the beginning of the week. This is in response to the heavy demand from the car builders and the shipyards. One concern alone sold 80,000 Car Wheels during the past week, while other buying has been equally heavy. The new price puts Plates on the 1.70c., Pittsburgh, basis, occupied by Structural Steel for the past six months. On the lakes several new boat orders are pending, but talk of an oversupply of vessels for the lake trade is causing some owners to hold off now. The activity in car building has been such, however, that any abatement in the demand for ship material would not materially affect the market. One car buyer in this territory placed an order for cars during the past week and was promised delivery March 1, 1907. The building movement in Cleveland is now more promising than it has been in several years. Spot material is scarce. Small consumers needing material quickly are still paying premiums ranging from $7 to $15 a ton at Eastern mills. Bar Iron is strong, with additional mills retiring from the market for the remainder of the first half. Quotations are 1.70c. to 1.75c. at Youngstown mill.

Old Material.—The market generally is strong, but the local situation is somewhat congested, the supply being unusually heavy. Prices in general are steady, dealers' quotations being as follows, gross tons: Old Steel Rails, $16.50 to $17.50; Old Iron Rails, $23 to $23.50; Iron Car Axles, $16.50 to $17.50; Heavy Melting Steel, $17 to $17.50. Net tons: Cast Borings, $9.50 to $10; No. 1 Busheling, $15 to $15.50; No. 1 Railroad Wrought, $17 to $18; Iron Car Axles, $22 to $23 (nominal); No. 1 Cast, $15; Stove Plate, $11; Iron and Steel Turnings and Drillings, $12.

Cincinnati.

FIFTH AND MAIN STS., January 10, 1906.—(*By Telegraph.*)

Pig Iron.—After an interval of quietness the new year starts off with considerable promise. There is a strong tone to the market that is making itself felt, and while there have been but two or three sales involving any considerable tonnage numerous inquiries have developed in a moderate way that augur well for the situation in general. There seems to be more than the ordinary demand for spot Iron of all grades and contract shipments are being hurried forward, showing very conclusively that consumption is proceeding at an enormous rate and melters are decidedly anxious to secure all the Iron they have bought. Sales from a carload up to 300 tons have been made in a number of instances, mostly for the first half. Gray Forge and No. 4 Foundry are reported to be in abundant supply and comparatively weak. There is a good demand for Basic, with quite a heavy inquiry for Malleable. It looks as though a large proportion of the Foundry Iron now being bought is in the nature of what might be termed for filling out purposes, as the general supposition is that most consumers are covered over the first quarter. Reports indicate that a number of the furnaces are fairly well sold up through the first quarter and are not seeking any new business for this period. Several of the large Pipe shops located in various sections have during the past week bought a heavy tonnage, which has had the effect of reducing very materially the amount of Iron on hand that has been holding the market on a $14, Birmingham, basis. While we believe there is yet quite a tonnage that is available at this figure, there

is certainly less than a week since, and reports indicate that a number of sales in a small way have been on a $14.50 basis, which is no doubt the maximum at the present time. This is also true as regards the Northern situation and the schedule of prices is apparently well established at from $17.50 to $18 at furnace. A sale was made in the Cleveland district last week of 1800 tons of Southern at $14, Birmingham, and 1200 tons of Northern at about $17.50 at furnace. A sale of 22,500 tons to a Pipe shop in northern Ohio was divided between Northern, Southern and Virginia Irons, and rumor says at a shade below established quotations. A sale of 3000 tons of Southern was made to a Michigan concern on a $14.50, Birmingham, basis. Several sales of Malleable were made on a $17.50 basis. It is said that another of the leading Pipe industries purchased in the neighborhood of 10,000 tons during the week and that a meeting is being held in New York to-day to take up the matter of further purchases. There was also a sale made to a Steel concern in the northern part of the State of 8000 or 10,000 tons of Bessemer and Basic. We report an inquiry for 5000 tons of Basic from Chicago territory for July, August and September delivery; also one from Michigan for 500 tons Foundry Iron. Freight rates from Hanging Rock district to Cincinnati are $1.15 and from Birmingham $2.75. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$17.25 to $17.75
Southern Coke, No. 2	16.75 to 17.25
Southern Coke, No. 3	16.25 to 16.75
Southern Coke, No. 4	15.75 to 16.25
Southern Coke, No. 1 Soft	17.25 to 17.75
Southern Coke, No. 2 Soft	16.75 to 17.25
Southern Coke, Gray Forge	15.50 to 16.00
Southern Coke, Mottled	15.25 to 15.75
Ohio Silvery, No. 1 (8 % Silicon)	21.15 to 21.65
Lake Superior Coke, No. 1	19.15 to 19.65
Lake Superior Coke, No. 2	18.65 to 19.15
Lake Superior Coke, No. 3	18.15 to 18.65
Car Wheel Irons.	
Standard Southern Car Wheel	$22.25 to $22.75
Lake Superior Car Wheel	21.00 to 21.50

Coke.—The market is decidedly weaker and prices are somewhat irregular. The car situation, especially in the Connellsville district, is materially better and reports indicate a full supply of equipment, with very little surplus coke in yards. The car supply in the Virginia field is still unsatisfactory, although there are marked signs of improvement shown. We quote the best brands of furnace grades from $3 to $3.50, f.o.b. ovens.

Finished Iron and Steel.—Trade still continues active and no change is apparent. The cold weather for the past few days has delayed structural work somewhat, but will have no sensible effect on conditions generally. Prices are firm and unchanged. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.65c., with half extras; the same, in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—Trade is quiet, with no new developments. It is expected, however, that the month will be productive of considerable business and dealers are quietly biding their time. We quote dealers' prices, f.o.b. Cincinnati: No. 1 Railroad Wrought Scrap, $17 to $17.50 per net ton; No. 1 Cast Scrap, $14 to $14.50 per net ton; Iron Rails, $20 to $21 per gross ton; Steel Rails, rolling mill lengths, $15 to $15.50 per gross ton; Relaying Rails, 56-lb. and upward, $24.50 to $25 per gross ton; Iron Axles, $22.50 to $23 per net ton; Car Wheels, $16.50 to $17 per gross ton; Heavy Melting Scrap, $15 to $15.50 per gross ton; Low Phosphorus Scrap, $18.50 to $19 per gross ton.

The Domhoff & Joyce Company, Cincinnati, has been appointed sales agent for the Wellston Steel & Iron Company's Wellston brand of Car Wheel, Malleable and Foundry Pig Iron.

Birmingham.

BIRMINGHAM, ALA., January 7, 1906.

Pig Iron.—More activity has been noted in the Iron market this week than for several past and buyers who failed to cover for their requirements for the first quarter, hoping for a decline, have been forced to make contracts at prevailing prices. Several orders for fair tonnage have been entered, but the business now being done is mostly with small melters for prompt delivery. There is an inclination on the part of larger buyers, who covered for their first quarter's requirements some months since, not to speculate further but play a waiting game. The furnacemen are seemingly also content to wait for what the future may bring forth and are offering no inducements on contracts for future delivery. Quotations are firm at $14.50 for No. 2 Foundry, with an upward tendency. With two or three exceptions the furnaces banked over the holidays have resumed operations and all will go in blast as soon as a surplus of raw material can be accumulated. Work on several stacks out of blast for repairs is being rushed as rapidly as possible, with prospects favorable for an early resumption. From all indications the year 1906 will break all previous records in production of Pig Iron in this district. The prices are very attractive, the demand is good and if sufficient labor can be secured to operate the mines, quarries and our modernized furnaces Birmingham will more than ever demonstrate that she is a factor to be reckoned with in the Iron world. Scarcity of cars continues to retard shipments, although the railroads are making strenuous efforts to relieve the situation.

Two new coal companies filed articles of incorporation here this week—the Acton Coal Company, with a capital of $325,000, composed of New Orleans and Birmingham capitalists, and the Maryland Coal Company, capitalized at $110,000, the stockholders of which are local men. Both will begin developments at an early date.

Cast Iron Pipe.—Among the inquiries reported this week were several for good sized tonnage for export to Cuba and South America. Much more activity is noted in this line than for several weeks previous to the holidays, and the prospects for a record breaking year are very bright. Following prices are quoted on Water Pipe per gross ton:

4 to 6 inch	$26.00
8 to 10 inch	25.00
12 to 20 inch	24.00
24 to 48 inch	23.00

Gas Pipe, $1 extra.

Old Material.—Dealers report business opening up well, with inquiries plentiful and fair stocks on hand. Quotations are approximately as follows per gross ton f.o.b. cars here:

Old Iron Rails	$21.50 to $22.00
No. 1 R. R. Wrought	19.50 to 20.00
No. 2 R. R. Wrought	18.00 to 18.50
No. 1 Country Wrought	17.00 to 17.50
No. 2 Country Wrought	16.50 to 17.00
Wrought Pipe and Flues	14.00 to 14.50
Mixed Steel	13.00 to 13.50
No. 1 Machinery Cast	12.00 to 12.50
Stove Plates and Light Cast	10.50 to 11.00

New York.

NEW YORK, January 10, 1906.

Pig Iron.—The business in Basic Pig Iron on the eve of closing last week has been placed, the Steel Corporation taking about 30,000 tons for delivery to the Penroyd Works during the first half of the year. One of the Plate mills of eastern Pennsylvania placed a like amount. The market remains steady. We quote Northern Iron, No. 1 Foundry, $19 to $19.25; No. 2 Foundry, $18.50 to $18.75, and No. 2 Plain, $18.25 to $18.50, tidewater. Southern Iron is selling at $18.75 to $19 for No. 1 Foundry and $18.25 to $18.50 for No. 2 Foundry.

Steel Rails.—Rail orders of the past week amount to about 45,000 tons, the largest being 21,000 tons for the M. K. & T. The Wabash has bought 5000 tons additional, making its total nearly 20,000 tons. The Chesapeake & Ohio has taken 3000 tons additional. Trolley road buying and the small orders from steam lines have amounted to about 15,000 tons since the beginning of the year.

Structural Material.—Only a small part of the railroad work that has been pending for some weeks has been closed. The Tidewater Railroad placed a contract this week for 5000 tons of bridge work, this being taken by the Virginia Bridge & Iron Company, Roanoke, Va. The same railroad is still in the market for about 20,000 tons of Steel for bridges. The New York Central Railroad has not yet awarded the contract for its new terminal station building, which will contain the post office and other offices, and a large Central Western contract for railroad bridge work is pending. The Chicago & Western Indiana Railroad placed a contract in the week for a moderate tonnage of bridge work and the C., B. & Q. has also closed for a portion of its new work. Both these contracts were taken by the McClintic-Marshall Construction Company of Pittsburgh. A considerable amount of new building is hanging fire in New York in addition to what has previously been mentioned, including a projected addition to the Whitehall Building. Some demand for Structural Steel for additions to manufacturing plants is noticed, including several hundred tons for Standard Oil Company works at Bayonne, N. J. These manufacturing additions are also yielding some good shafting and transmission equipment orders. Mills are able to make deliveries on both plain and fabricated shapes in from three to four months. For mill shipments, tidewater delivery, quotations are as follows: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. Beams, 18 to 24 inch, 0.10c. extra; Angles over 6 inches, 0.10c. extra. A good many buyers, unable to wait for mill deliveries, are paying premiums, but premium tonnage seems relatively not as large as a few months ago.

Plates and Bars.—Sales agents report the demand still running seasonably light on Bars, but with a little better

movement in Plates. Prices are firmly maintained on Plates, with premiums quoted by some of the leading manufacturers over official prices. Bar Iron is quoted at 1.84½c. to 1.95c., tidewater, for prompt delivery, and Steel Bars from 1.64½c. to 2c., tidewater, according to delivery desired. While a premium of $2 is asked by some manufacturers, others are continuing to quote Plates as follows at tidewater: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 1.94½c. to 2.04½c.; Fire Box Plates, 2.04½c. to 2.60c., according to specifications.

Cast Iron Pipe.—As was stated last week, R. D. Wood & Co., Philadelphia, have been awarded the contract to furnish 30,000 tons or more of Cast Iron Pipe for the New York high pressure fire protective system. The price fixed is $29, delivered, for the Pipe, and 2¾c. to 4½c. per lb. for special castings. Among the other contracts closed during the week was one for 8000 tons, which was given to the United States Cast Iron Pipe & Foundry Company by the Consolidated Gas Company of this city. The gas company is expected to make still further purchases in the near future. Gas interests in Philadelphia have also been placing some good contracts recently. It is expected that the Department of Water Supply of this city will shortly call for bids on a very large tonnage of 48-inch Pipe. The quantity may be in excess of 25,000 tons. The manufacturers of Cast Iron Pipe estimate the production of 1905 to have been at least 10 per cent. in excess of that of 1904, and they look for another heavy gain the present year. Carload lots are firmly held at $29.75 per net ton for 6-inch at tidewater.

Old Material.—Very little business has been closed during the past week and inquiries are light. Consumers are evidently sufficiently supplied for the present to relieve them from making purchases for prompt delivery. It is expected, however, that this condition of affairs will give way to activity before the close of the month. Genuine winter weather has at last made its appearance and the collecting of Scrap will undoubtedly be hereafter attended with greater difficulty. Holders meanwhile are refraining from pressing stock on the market, as practically all of them are shipping heavily on old contracts and therefore do not feel the accumulation of stocks to any extent. Prices are unchanged, as follows:

Old Iron Rails	$22.50 to $23.00
Relaying Rails	25.00 to 26.00
Old Steel Rails, rerolling lengths	16.50 to 17.50
Old Steel Rails, short pieces	16.50 to 17.00
Heavy Melting Steel Scrap	16.50 to 17.00
Standard Hammered Iron Car Axles	26.00 to 27.00
Old Steel Car Axles	21.00 to 22.00
No. 1 Railroad Wrought	21.50 to 22.00
Iron Track Scrap	18.50 to 19.25
No. 1 Yard Wrought, long	19.50 to 20.50
No. 1 Yard Wrought, short	17.50 to 18.50
Wrought Pipe	15.25 to 15.50
Light Iron	11.50 to 12.00
Cast Borings	9.25 to 9.50
Wrought Turnings	13.00 to 13.50
Old Car Wheels	18.00 to 18.50
No. 1 Machinery Cast	15.00 to 15.25
Stove Plate	12.00 to 13.00
Malleable Cast	15.50 to 16.50

The old firm of C. L. Peirson & Co., 44 Kilby street, Boston, and 16 Exchange place, New York, was dissolved December 30 by mutual consent, C. L. Peirson retiring. The business will be continued as before by the remaining partner, J. Brooks Fenno, who has been the active member of the firm for several years, and will be carried on under the firm name of J. Brooks Fenno & Co. The original firm was Stevenson, Peirson & Co., established in 1865, C. L. Peirson & Co. succeeding in 1884.

Metal Market.

NEW YORK, January 10, 1906.

Pig Tin.—In spite of the fact that 1515 tons of Tin have arrived in this country since the first of the month and 2815 tons afloat for American ports stocks in this market are very light, there being little spot Tin to be had and that little is held by strong hands. Prices have advanced steadily during the week, although the inquiry was light. On the 4th Tin sold at 36.10c., advancing to 36.15c. on the 5th, and being quoted still higher on the 8th and 9th at 36.20c. and 36.35c., respectively. To-day Tin is obtainable at 36.50c. Concessions of 10 to 15 points from this price can be secured for delivery from steamship Maine, due to arrive on the 17th. There seems to be a fair demand from the interior, but prospects at present look as if a considerable surplus would be accumulated by the end of the month. In London the market has advanced further, with futures still above the price of spot at £165 17s. 6d. and spot ruling at £165 10s. The statistics compiled by C. Mayer of the New York Metal Exchange show that the total supply of Tin for Europe and the United States during 1905 was 90,550 tons, against 92,400 tons during the year previous. The deliveries into consumption during 1905 are given as 93,754 tons, against 91,606 tons during 1904. The stocks held in London, Holland and the United States, together with the afloats for these ports, are given as 13,451 tons at the end of 1905, against 14,768 tons at the end of 1904. The consumption of Tin in the United States is given as 40,144 tons during 1905, as against 37,007 tons during 1904.

Copper.—The market appears to be slightly easier, consumers not being so willing to pay fancy prices for prompt deliveries. There is still considerable unevenness to the market and prices quoted on similar grades vary considerably. For strictly spot delivery premiums above 19c. would be demanded, but for delivery during the months of January and February Copper can be obtained at 19c. For March, April and May the quotation rules between 18½c. and 18¾c. For later months there is practically no market at present. The European markets have declined slightly, standard warrants ruling in London at £79 12s. 6d. for spot and £79 for futures. Best Select is £1 5s. lower, at £86 15s. The exports so far this month amount to 5398 tons. The export movement of Copper during 1905, as compiled by C. Mayer, secretary of the New York Metal Exchange, shows that 243,438 tons were exported during 1905, as against 252,313 tons during 1904. The shipments to Japan and China during 1905 aggregated 43,343 tons, as against 4675 tons the preceding year. The imports of Copper during 1905 are given as 94,600 tons.

Pig Lead.—This market continues in rather an unsettled state, as prices are higher in St. Louis than in New York. The softening in this market is caused by further arrivals from Europe, and an inability on the part of holders of foreign Lead to market their stock as anticipated at the 6c. level. Strictly spot Lead can be obtained in this market at 5.95c., but the St. Louis market is quoted at 6c. In London the price is lower at £17.

Spelter.—Business has been very quiet, and sales for spot in January have been made on a basis of 6.50c. to 6.60c. In St. Louis the market is also dull at 6.45c. to 6.50c. The London market has shown a little animation, and prices have been forced up further to £29 5s.

Antimony.—The price is very firm, Cookson's and Hallett's being held at 14.25c. to 14.75c., other grades ruling at 13.75c. to 14.25c. There is apparently a good demand for the metal at the ruling quotations.

Tin Plate.—The long expected announcement of an advance in the price of Tin Plate took place on Monday, when prices were advanced 10c. per box, or to a basis of $3.69, f.o.b. New York, and $3.50, f.o.b. Pittsburgh.

Old Metals.—There is a good demand for Scrap Copper products. Heavy Cut and Crucible Copper are now selling at slightly higher quotations. For round lots dealers are asking about the following prices:

	Cents.
Copper, Heavy Cut and Crucible	18.00 to 18.25
Copper, Heavy and Wire	17.50 to 18.00
Copper, Light and Bottoms	15.75 to 16.25
Brass, Heavy	11.50 to 12.00
Brass, Light	10.25 to 10.50
Clean Brass Turnings	10.25 to 10.75
Composition Turnings	13.25 to 14.00
Heavy Machinery Composition	15.25 to 15.75
Lead, Heavy	5.40 to 5.50
Lead, Tea	5.15 to 5.25
Zinc, Scrap	4.85 to 5.10
Aluminum Scrap	20.00 to 25.00

Pittsburgh.

PARK BUILDING, January 10, 1906.—(*By Telegraph.*)

Pig Iron.—The past week has been quiet, but prices are very strong. The furnaces have a good part of their output for January, February and March under contract and active negotiations are again on this week with the Steel Corporation for a large tonnage of Bessemer Iron for first quarter. The deal is expected to be closed in a very short time. There has been some contention over the price to be paid, but the two leading sellers are not disposed to shade $17.50, at Valley furnace. We quote Bessemer Iron at $17.50, at Valley furnace, but it is possible that a few small lots might be picked up from dealers at a little less. Basic Iron is ruling at about $17.25, Valley furnace. We note a sale of 1500 tons of Bessemer Iron for first quarter delivery at $17.50, at furnace. There is a moderate inquiry for Foundry Iron and several large local consumers in this district are expected to come in the market this month for heavy purchases running into the second and third quarters. We note more inquiry for Forge Iron, Northern brands being firm at $16.40 to $16.50, at Valley furnace, or $17.25 to $17.35, Pittsburgh.

Steel.—We note a continued great scarcity in the supply of Billets and Sheet and Tin Bars and the mills that sell Steel in the open market are still very much behind in deliveries. The shortage in supply of Sheet and Tin Bars will soon be relieved to some extent, as the Ohio Works of the Carnegie Steel Company are now rolling Sheet and Tin Bars and will continue to do so all of this month. We quote Bessemer and Open Hearth Billets at $26 to $27 and Sheet and Tin Bars in random lengths at $27 to $27.50, at maker's mill.

(By Mail.)

Better conditions than those which now prevail in the whole Iron trade would be almost impossible. The demand for all kinds of Finished Iron and Steel is unusually heavy, and tonnage already on the books of the mills guarantees operation to full capacity for the first six months in the year at least. As anticipated in this report last week, the American Sheet & Tin Plate Company has advanced prices of Black and Galvanized sheets $2 a ton and Tin Plate 10c. a box, effective from January 8. The American Steel & Wire Company and the independent mills have advanced prices on Wire products $1 a ton, effective from the same date. While sales of Pig Iron are not heavy the market continues unusually firm, with higher prices predicted before the year is very old. The Steel Corporation is expected to purchase this week a large tonnage of Bessemer Iron for first quarter delivery, and will likely take practically all of the surplus Iron of the Bessemer Pig Iron Association and W. P. Snyder & Co. The price will probably be $17.50, at Valley furnace. There is a moderate inquiry for Foundry and Forge Iron, Northern No. 2 Foundry being held at about $17.50 and Northern Forge $16.40 to $16.50, Valley furnace. There is no abatement in the scarcity of Steel, and some of the plants operated by identified interests of the Steel Corporation and which get their supply of Steel from the Carnegie Steel Company are running very short handed, not being able to get deliveries as fast as needed. Bessemer and Open Hearth Billets are held at $26 to $26.50 and Sheet and Tin Bars, in random lengths, at $27, maker's mill.

Muck Bar.—Inquiries have been light for some time, prices being a shade easier, but with the starting up of the mills after the holiday shutdown the demand will probably soon show betterment. We quote best grades of local Muck Bar made from all Pig Iron at $30.50 to $31, Pittsburgh, but note that Eastern mills are offering Bar as low as $30, delivered in the Pittsburgh district.

Ferromanganese.—Large consumers are covered by contracts on which deliveries are said to be coming forward a little better. Small consumers who have been caught short by delayed deliveries of Ferro and have had to buy a carload or two to help out have had to pay in some cases from $150 to $175 a ton for Foreign 80 per cent. Ferro. Large importers are offering Foreign Ferro for delivery commencing in May or June next at about $85, Pittsburgh.

Steel Rails.—Upward of 50,000 tons of new business have been booked since our last report and the Vanderbilt lines are in the market for a heavy tonnage, which will probably be placed before long. It is officially stated that the Rail mills now have about 2,000,000 tons on their books for 1906 delivery, but very little tonnage was carried over from last year. We note a heavy demand for Light Rails, which are firm in price and which we quote as follows: 8-lb., $36; 10-lb., $32; 12-lb., $30; 16-lb., $29; 20-lb., $28.50; 25 to 45 lb., $27.50 to $28, maker's mill.

Rods.—The activity in Wire products, together with the advance in prices just announced and the great scarcity of Billets, has brought about higher prices for Rods. The demand is active and Rods are scarce, most of the leading producers having none to spare. We quote Bessemer and Open Hearth Rods at $34 to $34.50, and note a sale of about 150 tons, on which the seller would not guarantee specified delivery, at $34, Pittsburgh. Open Hearth Chain Rods are also higher and we now quote these at $35, maker's mill.

Skelp.—The demand continues heavy and the mills are still behind on deliveries. Prices are very firm and we quote: Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.65c. to 1.70c., and Sheared, 1.75c. to 1.80c. These prices are for ordinary widths and are f.o.b. maker's mill.

Plates.—While new business in Plates is not as heavy as it was some time ago, the leading mills are practically filled up for the next three or four months and are still very much behind on deliveries. Shipments by the mills in December were enormously heavy and yet they are not catching up on deliveries to any great extent. We quote: Tank Plates, ¼ inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ⅛ of 1 per cent. is allowable. Pacific Coast base, 1.40c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—Local contracts placed during the week include 800 tons for the Commonwealth Trust Building, taken by the Fort Pitt Bridge Company. The report that the American Bridge Company has taken a Steel bridge for the Uniontown & Wheeling Railroad at Rice's Landing, Pa., is premature. This work is coming up, but has not yet been placed. Some other large local work is in sight, including the Union National Bank Building, and which will likely be placed this month. Prices are firm and we quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.70c.; 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—Effective January 8 the American Sheet & Tin Plate Company advanced Black and Galvanized Sheets $2 a ton; Blue Annealed Sheets, $1; Galvanized Roofing, 10c. per square, and Black Plate, $2 a ton. This advance was the result of the heavy demand for Sheets and the great scarcity and high prices of Sheet Bars, the mills having great trouble in getting them as fast as needed In fact some of the Sheet mills are occasionally compelled to shut down for a day or two at a time waiting for Sheet Bars to arrive. The new demand is fairly large, but we understand a very heavy tonnage was taken by some of the larger mills before the recent advance was made. We have advanced prices $2 a ton, and now quote: Black Sheets, Box Annealed, one pass through cold rolls, Nos. 10 to 12 gauge, 2c.; Nos. 13 and 14, 2.05c.; Nos. 15 and 16, 2.10c.; Nos. 17 to 21, 2.15c.; Nos. 22 to 24, 2.20c.; Nos. 25 and 26, 2.25c.; No. 27, 2.30c.; No. 28, 2.40c.; No. 29, 2.55c., and No. 30 gauge, 2.65c. We have also advanced Galvanized Sheets $2 a ton, and now quote: Nos. 10 and 11, 2.35c.; Nos. 12 to 14, 2.45c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.25c.; No. 28, 3.45c.; No. 29, 3.70c., and No. 30, 3.95c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 per square and Galvanized Roofing Sheets, No. 28 gauge, at $3 per square for 2½-inch corrugations. Jobbers charge the usual advances over these prices for small lots.

Iron and Steel Bars.—The official announcement of the Carnegie Steel Company that it will add a new Merchant Bar mill to its Duquesne Steel Works with a monthly capacity of 5000 tons will be of interest to the trade. New tonnage in both Iron and Steel Bars has fallen off to some extent, but specifications on contracts continue to come in very freely and the mills are still very much behind on deliveries. We quote Steel Bars at 1.50c., base, half extras, for carloads and larger lots. Iron Bars are quoted at about 1.90c., Pittsburgh, by outside mills, but the official price of Republic Iron & Steel Company on Iron Bars is 2c., Youngstown, or 2.04¾c., Pittsburgh.

Hoops and Bands.—New tonnage is fairly large, but specifications on contracts are coming forward very freely and give the mills plenty of work. We quote Steel Hoops at 1.85c. and Bands to be used for cooperage purposes at 1.85c., the latter carrying full Hoop and Band extras. Bands for other than cooperage purposes are 1.50c., base, half extras, as per Standard Steel card. Above prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery.

Tin Plate.—Effective January 8, the American Sheet & Tin Plate Company advanced prices on Tin Plate 10c. a box, or from $3.40 to $3.50. This advance is due to the heavy demand and also to the high prices in scarcity in Tin Bars, which the mills are having a good deal of trouble to get as fast as needed. The Tin Plate trade in November and December was very much more active than usual in those months and shipments by the mills were very heavy. We quote Tin Plate at $3.50 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days. Some mills allow a rebate of 5c. a box on the above price to the large trade.

Merchant Steel.—New business coming to the mills is not very heavy, but consumers are specifying on contracts freely, so that the mills are not able to catch up on deliveries to any great extent. Prices are firm and we quote: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to 1½ x ½ inch, 1.65c., and Iron Finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 inch, 2c., and 1⅛-inch and larger, 1.90c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.65c. to 1.70c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. Demand for Shafting is heavy, which we quote

at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The demand continues active and prices are very firm. The favorable weather has allowed track laying to go on uninterruptedly, and this explains to some extent the continued large demand for Railroad Spikes which we quote at $2 to $2.05 per 100 lbs., f.o.b. maker's mill.

Spelter.—The demand is very quiet, consumers preferring to hold off placing orders to find out whether present high prices are going to hold. On the other hand, there is no pressure on the part of producers to sell, and as a result prices continue very firm. We quote prime grades of Western Spelter at 6.45c. to 6.50c., St. Louis, equal to 6.57½c. and 6.62½c., Pittsburgh.

Merchant Pipe.—We note a continued active demand for Pipe, the leading mills being pretty well filled up with business for the next several months. There has been no advance in prices, but a readjustment of discounts has been made involving some unimportant changes. These official discounts, as recently rearranged, are as follows:

Merchant Pipe.

	Jobbers, carloads.				Consumers, carloads.			
	Steel.		Iron.		Steel.		Iron.	
	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.
	%	%	%	%	%	%	%	%
⅛ and ¼ inch	72	56	69½	53½	71	55	68½	52½
⅜ inch	74	66	73½	61½	73	59	72½	60½
½ inch	76	64	73½	61½	75	63	72½	60½
¾ to 6 inches	80	60	78	68	79	69	77	67
7 to 12 inches	75	60	73	57½	74	59	72	56½
Extra strong, plain ends:								
⅛ to ⅜ inch	65	53	62½	50½	64	52	61½	49½
½ to 4 inches	72	60	69½	57½	71	59	68½	56½
4½ to 8 inches	68	56	65½	53½	67	55	64½	52½
Double extra strong, plain ends:								
½ to 8 inches	61	50	58½	47½	60	49	57½	46½

Boiler Tubes.—New tonnage is light, but the mills have a good many unfilled contracts on their books on which consumers are specifying quite freely. The recent unevenness in prices on Steel Boiler Tubes has resulted in a new list of discounts being issued by the National Tube Company, in which prices on Steel Boiler Tubes have been reduced two points, or about $4 a ton. This new list of discounts is as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ inches	41	46
1¾ to 2¼ inches	41	58
2½ inches	46	60
2¾ to 5 inches	53	66
6 to 13 inches	41	58

Iron and Steel Scrap.—The demand is showing some betterment, due to the starting up of the mills after the holiday shutdown. Prices are fairly strong and dealers quote about as follows: Heavy Melting Scrap, $17.50 to $18; No. 1 Wrought Scrap, $19.50 to $20; Cast Iron Borings, $10.75 to $11; Bundled Sheet Scrap, $15 to $15.25; Old Steel Rails, short pieces, $17.50 to $18; long pieces, which seem to be in fairly active demand, are held at $18; Machinery Cast Scrap, $15.50 to $15.75; Cast Steel Scrap, $17.50; Old Iron Axles, $27 to $27.50; Old Iron Rails, $24.50 to $25; Malleable Iron Scrap, $15.50; Steel Turnings, $13.75 to $14; Old Car Wheels, $18, all in gross tons, f.o.b. Pittsburgh.

Coke.—Official figures are not yet available, but the output of Coke in the Upper and Lower Connellsville regions in 1905 is estimated at 16,500,000 tons, which beats the best previous year by at least 3,000,000 tons. The heavy output of Coke, together with a full supply of cars, has brought about somewhat lower prices and we quote strictly Connellsville Furnace Coke at $2.65 to $2.75 a ton at oven. Connellsville 72-hour Foundry Coke for prompt delivery is held at $3.40 to $3.50 a ton, the latter price being quoted for first quarter delivery. There is not much demand for either Furnace or Foundry Coke, as consumers are pretty well covered. The output continues very heavy, the Upper and Lower Connellsville regions having turned out last week about 375,000 tons.

James R. Darragh has been appointed Western manager for Rogers, Brown & Co., Farmers' Bank Building, Pittsburgh, succeeding G. P. Bassett, Jr., resigned.

W. Y. Humphreys and Herman Griffin, heretofore comprising the firm of Humphreys, Stewart & Co., Iron and Steel factors, Lewis Building, Pittsburgh, Pa., announce that the style of the firm was changed January 1 to Humphreys, Griffin & Co., who have assumed the contracts, will pay all debts of the old firm and continue its business.

The Fisher Foundry & Machine Company, Pittsburgh, works at Ford City, Pa., builder of general rolling mill equipment, has leased rooms 1213-1214 Empire Building, Pittsburgh, where its offices are now located.

Within the short period of seven years ending with 1904 the railroad freight traffic of the United States doubled, while the passenger traffic increased to the extent of about 75 per cent.

Iron and Industrial Stocks.

NEW YORK, January 10, 1906.

The week has been quite an eventful one in iron and industrial stocks. In some cases new high records have been made. Tennessee Coal soared to 150½ this morning, which was a very great surprise, as it had declined to 129½ on the previous Friday. Republic stocks on Tuesday made a new high record of 110½ for the preferred and 38¼ for the common. The stocks of these two companies are undoubtedly influenced by the arrangements for the approaching consolidation. United States Steel preferred also made a new high record on Tuesday, when it touched 107⅞, while on Monday the common reached 45 for the first time in three years. The transactions in United States Steel common have been unusually heavy for the greater part of the week. Among other stocks which showed heavy gains during the week were Crucible Steel preferred at Pittsburgh, which advanced from 71½ on Thursday to 79½ on Tuesday; Cambria Steel at Philadelphia, which advanced from 30¾ on Friday to 34⅞; Colorado Fuel, which touched 59⅞; Pressed Steel common, which reached 57⅜; Sloss-Sheffield common, which advanced to 91, all on Tuesday, and the United States Cast Iron Pipe common, which moved up from 46½ on Thursday to 52¾ on Monday. American Locomotive common declined from 78½ on Thursday to 76¼ on Friday, advanced to 78 on Saturday and declined to 76 on Tuesday. Last transactions in active stocks up to 1 p.m. to-day were made at the following prices: Can common 10, preferred 70½; Car & Foundry common 42½, preferred 100; Locomotive common 76, preferred 117½; Steel Foundries common 14⅝, preferred 50¾; Colorado Fuel 58¼; Pressed Steel common 55⅞, preferred 100; Railway Spring common 60½; Republic common 36¼, preferred 107⅞; Sloss-Sheffield common 90; Tennessee Coal 150; United States Cast Iron Pipe common 50⅞, preferred 95¼; United States Steel common 44⅛, preferred 107¼.

Union Switch & Signal Company, Pittsburgh.—Stockholders of this company have been invited to subscribe for 5000 shares of the new stock of the company at the price of $75 a share. Subscription must be made not later than January 25 and the amount is limited to one-eighth of the present holdings of the stockholders. The issue now proposed to be put out is part of the issue of the 20,000 shares increase authorized June 16, 1903, and of which 10,000 shares were issued at that time. This leaves still 5000 shares in the treasury of the company. In the letter directed to the stockholders the purpose of the new issue is stated to be to provide for the expanding business of the company. In the last year about $100,000 was expended in improvements in the shops and machinery and paid out of current earnings and some further small expenditures are necessary. In the last three years the dividend rate has twice been increased and the bonded indebtedness reduced from $530,000 to $369,000, and the surplus has been increased 38 per cent. There is now on the books about four months' business for the current year and the prospects for the coming year indicate a great volume of business.

Dividends.—Youngstown Sheet & Tube Company has declared the regular quarterly dividend of 1¾ per cent.

Vulcan Detinning Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock and an extra dividend of 1 per cent. on account of accumulated unpaid dividends of 9¾ per cent. on the same stock.

People's Natural Gas & Pipeage Company, Pittsburgh, has declared a quarterly dividend of 2 per cent., payable January 20.

The Harbison-Walker Refractories Company, Pittsburgh, has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable January 20.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has declared a quarterly cash dividend of 2 per cent. and a stock dividend of 50 per cent.

The Wheeling Steel & Iron Company, Wheeling, W. Va., has declared a 2 per cent. cash dividend and is expected to declare a stock dividend before long. Preferred shares of this company have recently sold as high as $152 a share, par value being $100.

United States Cast Iron Pipe & Foundry Company has declared the regular dividend of 1¾ per cent. on the preferred and a second dividend of 1 per cent. on the common stock. The initial dividend of 1 per cent. on the latter was declared three months ago and is regarded in the light of a quarterly disbursement. It is said the business of the company warrants this.

The Schlieper Engineering & Contracting Company, Pittsburgh, has been awarded the contract for a steel casting plant for the Steel Foundry Company, Cincinnati. A main building, 135 x 260 feet, and a power house, 30 x 120 feet, will be erected. The equipment will include one 10-ton open hearth furnace, with drying, annealing and core ovens, besides a converter of the Tropenas or Rapke type for use in making small castings of high

grade steel. Oil will be used for fuel and Tate-Jones burners will be installed for this purpose. Work on the new building has been commenced and it is expected that the first casting will be made about May 1.

The Alabama Consolidated Coal & Iron Company.

The annual report of this company for the fiscal year ended October 31 enables the following comparison of its financial operations to be made:

	1905.	1904.	1903.
Gross earnings	$3,555,644	$2,729,026	$3,180,332
Expenses, interest, &c.	2,996,183	2,536,535	2,566,914
Net	$559,461	$192,491	$613,418
Depreciation, State tax, &c.	147,984	136,854	102,106
Surplus	$411,477	$55,637	$511,312
Dividends	87,500	153,125	199,980
Surplus	$323,977	*$97,488	$311,332

* Deficit.

The company's product for the year and the preceding two years was as follows:

	1905. Gross tons.	1904. Gross tons.	1903. Gross tons.
Pig iron	118,829	135,610	107,286
Coal	642,230	530,106	518,623
Coke	268,383	234,096	217,803

In his accompanying remarks President T. G. Bush says:

"Referring to the total output of iron for the year, it will be noted that practically one of the best furnaces was out of blast four months or longer.

"The improvements at the mines during the year were chiefly additional buildings needed where the output of the mine was being increased; also in increasing the capacity for storage of coal and improvements in connection with the coal crushers and coal washers and other changes necessary for better handling of the output, &c. There were also some improvements made at the ore mines with a view of increasing their output and efficiency. The new coke ovens contracted for are 100 located at our Lewisburg mines, near Birmingham, and 50 at our Searles mines. When they are completed we will have a total of 915 ovens.

"With all the improvements now under way completed and utilized I estimate that the capacity and resources of the company will be about as follows: Four furnaces, with a capacity of 200,000 tons of iron per annum; coal mines with a capacity of more than 700,000 tons per annum; 915 coke ovens, with a capacity of 325,000 to 340,000 tons per annum; ore mines and limestone quarry with a capacity for the needs of the furnaces.

"To meet the requirements for funds for construction of the new furnace at Gadsden and for other improvements the bonds in the treasury which were available for company purchases, amounting to $510,000, were disposed of by the directors, and the proceeds are being applied to said improvements. The additional amount required for these improvements is being provided out of the surplus funds of the company."

President Bush also alludes to the scarcity of labor with which Southern manufacturers are contending.

The Dominion Steel Plant Makes a New Record.—During the month of December the open hearth steel department of the Dominion Iron & Steel Company's plant at Sydney, Nova Scotia, turned out 20,450 gross tons of ingots, thus breaking its October record, which was its best up to that time by 1500 tons. When it is considered that some 80 per cent. of the metal charged in the furnace contains 1½ per cent of phosphate and 1½ per cent. of silicon, and that the limestone and ore contents of each heat average 45 per cent. of the total metallic charge, it must be admitted that this is very creditable work and speaks volumes for the superintendent, William Brown, who has increased the output 35 per cent. during his connection with the company.

The Miller-Collins Company, contracting engineer, 1133 Broadway, New York, gave its first annual dinner December 30, at the Engineers' Club, New York. It was attended by the entire office and field staff of the company. The afternoon was passed in a general discussion leading to economical improvements in operating methods and the perfection of a report system that will simplify as well as promote a still greater proficiency and co-operative spirit in the administration of future work. The repast which followed was thoroughly enjoyed and the evening was devoted to informal contributions to the general entertainment.

Car and Locomotive Orders in 1905.

The *Railroad Gazette's* statistics of the car and locomotive output of 1905 of the United States have already been given in these columns. They showed that the car companies delivered in 1905 168,006 cars, this being exclusive of cars built by the railroads in their own shops. The number of locomotives built in 1905 was 5491 apart from those built by the railroads in their own shops. The *Railway Age* gathers car and locomotive statistics on another basis, presenting each year the number of cars and locomotives ordered in the twelve months. For 1905 the total of freight cars ordered was 341,315; of passenger cars 3289, and of locomotives 6265—a remarkable showing. A comparison of these figures with those for the four years preceding is as follows:

	1901.	1902.	1903.	1904.	1905.
Locomotives	4,340	4,665	3,283	2,538	6,265
Passenger cars	2,879	3,459	2,310	2,213	3,289
Freight cars	193,439	195,248	108,936	136,561	341,315

A partial list of interurban cars ordered in 1905 is given, the total being 3767. This is in addition to the figures in the above table. The *Railway Age* adds: "The aggregate capacity of the car and locomotive plants and the railway shops which build new equipment is not sufficient to produce in a twelvemonth the large results represented in our footings. It therefore follows that the orders here recorded will, in many cases, carry the builders far into the present year and possibly, in some cases, beyond the end of 1906 before deliveries will be completed. It is not likely, in view of this condition of affairs, that the orders for 1906 will reach the high level of the year just closed."

Locomotives for New South Wales.—The Clyde Engineering Company, Clyde, near Sydney, N. S. W., has at length secured the order for the construction of 60 locomotives. The contract was signed October 21, and provides for the delivery of the first six engines within two years, and the balance at the rate of ten engines per annum, thus taking seven and a half years to fill the contract. Thirty are to be passenger engines of 70½ tons each, and 30 to be freight engines of 79½ tons each. The price to be paid is £71 13s. 11d. per ton, which is an average of about £5400 per engine.

The Astoria Steel Foundry Company has leased the wooden building of the Astoria Steel Plant, Astoria, L. I., which is in the shape of an L and has a floor space of about 25,000 square feet, to manufacture steel castings, such as risers, treads and posts. The company will later branch out into other lines suitable for molding machines and the foundry will be run entirely with molding machines and will melt daily on an average of 12 tons for the first six months. The plant, which will be opened by the middle of January, has enough orders to keep it busy for some time to come. Walter H. Storm, formerly of Walter H. Storm & Co., New York, will be in charge of the plant.

The American Shipbuilding Company, Cleveland, Ohio, has closed a contract with Henry A. and H. B. Hawgood for the building of a third Lake freighter to have a carrying capacity of 11,000 tons. The new boat, which will be a duplicate in size of the steamer James C. Wallace, will be 552 feet over all, 532 feet keel, 56 feet beam and 31 feet deep and will have triple expansion engines and two Scotch boilers. This makes a total of 31 vessels for which contracts have been taken by the American Shipbuilding Company in nine months.

Extensions and Betterments at United States Steel Corporation Plants.

There has been authorized by the United States Steel Corporation a very extensive programme of enlargement and betterment at the different manufacturing plants of the subsidiary companies which will increase the annual capacity of pig iron by very close to 1,000,000 tons, the capacity for the production of steel ingots by 535,000 tons and the capacity for finished iron and steel by over 750,000 tons. This does not take into account at all the great new works which are planned for the Chicago district and which cannot be expected to add to output until well into the fall of 1907. Nor does it deal with the expenditures authorized for expansion and improvement of the ore properties and the handling of ore.

A considerable part of the improvements will be made at the principal works of the Carnegie Steel Company, followed in importance by the Illinois Steel Company and the American Steel & Wire Company. We enumerate below some of the principal features of this admirable programme.

At the Homestead works of the Carnegie Steel Company, the 35 and 40 inch mill, the large beam mill, will be doubled. There will be built another group of 10 open hearth furnaces, and by the removal from the Twenty-ninth street works to Homestead, what is practically a new 72-inch sheared mill will be erected. By remodeling, the 23-inch mill at Homestead will be doubled in capacity. Two entirely new blast furnaces will be added to the Carrie plant, which serves Homestead.

At the Duquesne Works, the Bessemer department will be supplied with a new 200-ton mixer. The most important improvement will be the erection of a new bar mill for rolling rounds from 2 to 6 inches. The 26-inch roughing mill and the two 21-inch mills will be moved and the 16-inch mill will be replaced by a 14-inch mill.

The Ohio works is to have a new blooming mill.

At the Edgar Thomson works a large appropriation has been made for ore handling machinery, and a considerable sum has been set aside for changes and alterations in the converting and rail mill departments. The blowing capacity of the furnaces is to be strengthened by a number of compound condensing blowing engines and a new machine shop is to be erected for the steel department.

At the Isabella furnace plant furnace No. 2 is to be entirely rebuilt.

Very extensive additions are to be made to the different plants of the Illinois Steel Company. At the South Works an entirely new 30-inch universal plate mill is to be erected, and there is to be built a new light rail mill, which will fill the same functions which the mill recently erected at Edgar Thomson fills at that plant.

Three of the blast furnaces are to be remodeled and 40 water tube boilers are to be added to the group. At another group the hot blast stoves are to be rebuilt and there are to be erected gas blowing engines. The Joliet plant is to have an entirely new blast furnace and additions are to be made to the bolt and nut factory.

Quite a number of betterments are to be made to the different plants of the American Steel & Wire Company. These include an extension of the ore docks at the Central plant at Cleveland, an additional open hearth furnace at the Newburg Steel Works, new engines for the rod mill roughing train and for the wire and nail mills at the H. P. works, new engines at Allentown, additional cold rolling shafting, wire drawing, galvanizing, rope making and insulating machinery at different plants.

The Lorain plant is to have new ore handling machinery at the old ore dock, and extensive improvements are provided for at the Johnstown plant. Two new lap weld furnaces are to be added to the Pennsylvania works of the National Tube Company.

Comparatively little work is provided for the plants of the American Sheet & Tin Plate Company. Another open hearth furnace is to be added to the Vandergrift steel plant, which is also to be changed for casting on cars and for stripping. At the Pennsylvania plant there will be general improvements and the conversion from a six to an eight mill plant.

The 20-23 inch mill at the Pencoyd works of the American Bridge Company is to be improved and the betterments at the blooming mill are to be continued.

Provision has been made for 500 new steel gondola cars for the Union Railroad and for 500 steel cars for the Elgin, Joliet & Eastern Railroad.

A new ore bridge is to be placed on dock No. 4 of the Pittsburgh & Conneaut Dock Company.

Appropriations have been made for quite extensive improvements at a number of the power plants of the different works, by coal and ash handling machinery, stokers, condensing plants, and for additional water supply.

American Steel & Tube Company.—Certain of the active and largely interested officers of the American Shovel & Stamping Company, Lorain, Ohio, have organized the American Steel & Tube Company, with a capital stock of $100,000, which will be increased from time to time to meet business requirements. The new company is now installing a combination mill on property adjacent to the American Company's present plant, in conjunction with which it will be operated. The layout and equipment of the new mill is not only practical but unique, because of its various adaptability, which makes it susceptible of large expansion. The annual capacity will be from 50,000 to 75,000 tons, the product consisting of sheet bars, sheets, slabs, plates, special analysis high carbon plates for agricultural implement parts and shapes, skelp, tack and mill plates of various widths, nonwelded butt tubing for agricultural implement and bedstead manufacturers, tie plates and muck bars. After the completion of the plant it is the intention to install in addition a strictly up to date 12-inch guide mill with an annual capacity of from 20,000 to 30,000 tons of finished bars and angles of various sizes. The product will be puton the market under the brand "Veribest."

The annual report of the Fried. Krupp Company of Essen, Germany, shows that the profits of the different plants during the fiscal year ending June 30, 1905, amounted to 22,904,817.82 marks. Interest and miscellaneous income carried this profit to 24,879,646.20 marks. There were paid for taxes 1,932,173.43 marks, for workmen's insurance, 2,643,321.33 marks and for welfare work of all kinds, 3,891,098.77 marks, leaving a net profit of 16,413,052.67 marks. Of this 5 per cent. was set aside for legal reserve and 2,400,000 marks for special reserve. A dividend of 7½ per cent. was declared on the 160,000,000 marks for share capital and 1,000,000 marks was assigned as an extra contribution to the pension and welfare fund.

At the present time the Westinghouse Electric & Mfg. Company is employing 10,032 men at its shops at East Pittsburgh. Shipments each month of electrical equipment are considerably over $2,000,000, and the payroll every two weeks amounts to between $215,000 and $225,000.

It is understood that the municipality intends to build a trolley bridge of new type over the Dutch Kills Creek in Long Island City at an estimated cost of $175,000.

OBITUARY.

CHARLES S. GUTHRIE.

Charles S. Guthrie died suddenly from the effects of an operation for appendicitis on Thursday last at his shooting preserve near Salisbury, N. C. Mr. Guthrie, who was in the forty-third year of his age, was born at Zanesville, Ohio, and was connected with the iron industry during the greater part of his business career. He first became prominent only a comparatively few years since as the representative of Naylor & Co. of New York, during the period when they were general sales managers of the Tennessee Coal & Iron Company, who were then making only pig iron. When that connection ceased Mr. Guthrie entered the wider field of the same trade in connection with the Pittsburgh office of Naylor & Co., and soon afterward was admitted to partnership in the firm. It was he who was chiefly instrumental in organizing the American Steel Hoop Company, whose affairs he conducted as president until the company became one of the constitutent companies of the United States Steel Corporation. Fond of outdoor life, and desirous of re-establishing his health, which had been somewhat impaired, Mr. Guthrie retired from active business. Last year he took an increasing interest in some very comprehensive plans connected with the iron industry, among which was the consolidation of the leading Southern iron properties and in the affairs of the Republic Iron & Steel Company, in which he had always retained a large interest. He became chairman of the Board of Directors of the company and only recently was the most active of the group of financiers who acquired control of the Tennessee Coal, Iron & Railroad Company. At the time of his death he was maturing very far reaching plans for the development of the property, having been deeply impressed with its latent mineral wealth. Mr. Guthrie was generally regarded in the iron and steel trades as one of the strongest of its younger men, who possessed an intimate knowledge of the industry, mature judgment and a high order of executive ability.

ROBERT R. STANNARD, president of Blake & Johnson, corporation, Waterbury, Conn., died very suddenly January 4, aged 58 years. He was born in Clinton, Conn., April 25, 1847. His early education was obtained at the district school and at Clinton Academy, and he was afterward a student at the Hudson River Institute, Claverack, N. Y., and at a business college at New Haven. After three years in the dry goods business in New Haven, as a bookkeeper, he entered the employ of Blake & Johnson, at Waterbury, in 1869. In 1873 he was made secretary of the corporation and five years later a director. He was subsequently elected president and treasurer of the company, which offices he held until his death. He was prominent as a member of the First Church of Waterbury and at his death was a deacon. Mr. Stannard is survived by his widow and one daughter, the wife of Robert P. Lewis, an officer of the Blake & Johnson corporation.

JOHN W. PAXSON, founder of the J. W. Paxson Company, Philadelphia, died January 3, aged 87 years.

WILLIAM J. LEWIS, for many years president of the Oliver Iron & Steel Company, died January 3 at his residence in Hazlewood, Pittsburgh, aged 75 years. His death was from general breakdown, due to old age. He leaves one son and six daughters.

The American Pig Iron Storage Warrant Company had 57,200 tons of pig iron on hand December 31, 1905, as compared with 63,900 tons on November 30. The deliveries were 9300 tons in December and the receipts 2600 tons.

The regular January meeting of the Pittsburgh Foundrymen's Association has been cancelled, owing to the holidays and other engagements of the members, which would prevent a full attendance. At the February meeting it is intended to have a dinner and some speakers, and an interesting programme has been arranged.

Pacific Coast Trade Prospects.

SAN FRANCISCO, CAL., December 30, 1905.—Rain has fallen in sufficient quantity to allow the farmers to plow and put in grain in the Central and Coast sections of the State, though hardly sufficient in the northern part or in the Sacramento Valley. Although even with rain we are not absolutely certain of a grain crop, our agriculture is diversified and fruit to a certain extent makes up for deficiency in grain, as the fruit crop keeps on increasing in value every year. The mines have been more productive in recent years, the oil industry has been fairly flourishing and the lumber business especially prosperous. It may therefore be said that the outlook for 1906 is for good trade in all directions, on account of the prosperity in the mines, in the lumber districts and in the oil industry. The demand for machinery and supplies will be very great. The building boom shows no signs of abatement. This calls for large supplies of nails, building hardware and other materials.

During the present month large supplies of hardware, iron and steel, pipe, &c., have come to hand by the Pacific Mail steamers, while the arrival of several vessels from Antwerp and Newcastle-on-Tyne have brought to hand large supplies of pig iron, merchant iron, &c. Imports by rail have been light, on account of the approach of the new year. There has been an active holiday trade among the retailers and an especially good demand for fancy cutlery, but the wholesale houses, as usual at this season, have had a comparatively quiet time for some weeks. Exception should be made, however, in regard to pipe, for which there has been a large demand. Business, however, in the wholesale and jobbing line is fully up to that of any other year.

The foundries and machine shops have as a rule been fairly busy. The demand for machinery for export has been good, as also for machinery for steam schooners, of which several have been built and more are building. Wherever they are built along the coast they come here to have their machinery put in. Some of the manufacturers have been especially successful and one, the Pacific Jupiter Steel Works in this city, is about to enlarge its plant, as the demand is greater than the present capacity can supply.

The exports of machinery and iron and steel to the Orient continue large. The Manchuria cleared December 16 with invoices for Japan of locomotives valued at $106,-132; structural iron, $40,200; motors, $27,300; general machinery, $59,740, and for China valued at $93,106, or over $320,000 altogether, being about one-fifth of the total value of the cargo. The Manchuria also had considerable value in hardware, nails, &c., although in the matter of nails we have lost the trade that we used to enjoy, owing to the Japanese having taken to manufacturing this line of goods themselves and to making styles and descriptions of their own devising. They studied our work in this line until they became proficient and are now independent of us. Nevertheless Japan is now the principal field for our exports of machinery, though the clearances for the Hawaiian Islands and Mexico have taken considerable supplies. Iron pipe has of late been much in demand in the Hawaiian Islands. J. O. L.

The Western Society of Engineers.—At the annual meeting, held in the society's rooms in the Monadnock Block, Chicago, January 2, officers were elected for the ensuing year as follows: President, Bion J. Arnold of the Arnold Electric Company, Chicago; first vice-president, W. L. Abbott of the Chicago Edison Company; second vice-president, Andrews Allen of the Wisconsin Bridge & Iron Company; third vice-president, Prof. Dugald C. Jackson of the University of Wisconsin; treasurer, Albert Reichmann of the American Bridge Company; trustee, F. H. Bainbridge, assistant engineer, Chicago & Northwestern Railway. Trustees are elected one each year for a term of three years. The other two members of the board are T. W. Snow of the Otto Gas Engine Works and G. M. Wisner of the Sanitary District of Chicago.

The Machinery Trade.

NEW YORK, January 10, 1906.

Since the beginning of the new year nothing very large in the way of new business has come before the machinery trade except in inquiries. The large volume of scattered orders which prevailed during the last of the old year continues in all branches of the business and machinery houses have enough to do to fill the demand. A number of inquiries for heavy machinery, such as rolling mill equipment and heavy engines, have come before the trade, but there is nothing big in those lines in the way of specifications. The Japanese are buying considerable factory equipment just now, and the demand from that country seems to be for a general assortment of tools. Shipments on mining machinery to Japan are still being made. Some houses have received orders of late from Russia, but they are generally accompanied with instructions to hold shipments until notified.

Makers of steam specialties are looking forward to the future with considerable anxiety as a result of the scarcity of copper and its increasing price. Many of them have orders that will keep their plants running several months ahead, and while they are all considering the necessity of raising prices many of them are considerably worried as to how they are going to obtain material to fill their present orders. Orders are coming in in good volume, and if there was a good supply of copper on hand the manufacturers would want nothing better.

The National Supply and Machinery Dealers' Association, whose headquarters are at Cleveland, Ohio, and of which J. H. Drury is secretary and treasurer, will hold its first annual meeting at the Hotel Chamberlain, Fortress Monroe, Va., February 14, 15 and 16. It is expected that questions of considerable interest will be brought up for consideration before the convention.

From the efforts being made by the Rapid Transit Commission to have constructed as soon as possible part of the subway system which has been laid out for the city, it is likely that bids will be asked for some of the work in the early spring. The first lines the commission is planning to have constructed are the Third, Lexington, Seventh and Eighth avenue lines.

A new competitor for the privilege of building subways in Brooklyn has arisen. J. Edward Swanstrom, formerly Borough President, is at the head of a new company that will put in bids before the Board of Rapid Transit Commissioners. The organization of this company is interesting in view of the fact that the interests of the Interborough Rapid Transit Company have taken over all the lines in Manhattan, and indicates that the combination will not be the only bidders for future subways and tunnels.

Important Machinery Requirements.

It is thought that the Ohio Central Railroad will build new shop buildings in Bucyrus, Ohio, as soon as the weather will permit. Plans have been prepared for a car repair shop, 35x400 feet, and boiler shop, 50x102 feet.

General Manager Atterbury of the Pennsylvania Railroad has confirmed the story that the company would construct and operate a high speed electric line connecting Newark and New York. It is understood that negotiations are under way between the Pennsylvania Railroad and the Public Service Corporation of New Jersey whereby the road will be constructed in connection with latter company, from whose power plant the road will be operated. The plans provide for entering New York through the McAdoo tunnel, the terminal of which is at Cortlandt street. It is admitted by those interested that the power generated in the new plant of the Public Service Corporation on the Hackensack Meadows will be needed for the company's present lines, and if the combination of interests goes through a considerable extension to the power plant will have to be made. Even if a scheme of consolidation does not go through it is believed that the Public Service Corporation will go ahead with its plans to extend its plant.

The Central Railroad of New Jersey will build during the year a large terminal at 125th street, New York, and a million dollar storage warehouse at Newark, N. J. The company's property on the water front at Jersey City will also be extensively improved.

Benjamin Atha & Co., Newark, N. J., are getting bids on machinery and equipment for the addition to be made to its plant in the way of three 20-ton open hearth furnaces. The company has inquiries out for conveying machinery among other things.

The American Locomotive Company is still buying equipment for its plants at Dunkirk and Schenectady, N. Y. The equipment now being purchased consists principally of small machine tools.

The new open hearth steel plant and rolling mill to be built on Staten Island by Milliken Brothers, 11 Broadway, is well under way. The contract for the boilers, amounting to 4,000 horse-power, has been placed with the Babcock & Wilcox Company, and the Morgan Engineering Company and Manning, Maxwell & Moore, incorporated, secured the orders for the electrical traveling cranes, of which there are quite a large number. The latter firm is agent for the Shaw Crane Company. The order for the large engine for the rolling mill has been placed with the Southwark Foundry & Machine Company, Philadelphia. There remains a number of orders for lines of small equipment to be awarded.

An entire equipment of machinery for a modern plant is required by the Waterman Car Wheel & Foundry Company, Houston, Texas, which was recently organized and which will construct a plant for the manufacture of cast iron chilled car and engine wheels, with a capacity of 200 wheels a day. The company has secured a site, 300x1300 feet, on the Missouri, Kansas & Texas Railroad, where it will start at once upon the building of a new plant, which will consist of a main building, 100x235 feet, to contain eight wheel floors of 25 wheels each; a power plant, core rooms and ovens. The buildings will be constructed so that they can be added to at any time should occasion call for an increase in the output. The company hopes to have the plant in operation some time between April 15 and May 1. The officers are J. J. Settegast, Jr., president; W. H. Waterman, first vice-president and general manager; G. H. Hermann, second vice-president, and A. J. Binz, secretary and treasurer.

The recently organized Wheeling Enameled Iron Company, Wheeling, W. Va., which is installing a new plant, has now decided upon some of the machinery which it will require for equipping the building. At the present time the company is in the market for two air compressors, 150 horse-power gas engine, 50 horse-power generator and a number of electric motors, etc. This enterprise is headed by Charles W. Franzheim, who is president and general manager of the Wheeling Potteries Company.

The American Radiator Company, Chicago, Ill., announces the purchase of the Payne Engine Works in Elmira, N. Y., which it will probably remodel at a considerable cost. The company informs us that it has not yet definitely decided as to the improvements that it will make to the plant. As was announced some time ago, the company is to erect an extensive plant at Hull, England.

The Crescent shipbuilding plant at Elizabeth, N. J., which was one of the important branches of the defunct United States Shipbuilding Company and which later became a constituent company of the Bethlehem Steel Corporation has been sold to H. G. Layng, a consulting engineer, of 118 Broadway. Mr. Layng has organized a company for the manufacture of briquettes of coal dust. No details have been given out as to who the interested capitalists are outside of Mr. Layng, but it is stated that machinery is being bought for equipping the plant and within a short time it will be operated.

Contracting and electrical engineers of New York are sending out inquiries for three vertical engines to develop 200 kw. of power for a hotel to be built by the Cincinnati Realty Company at Cincinnati, Ohio.

The Board of Construction and Supplies, Albany, N. Y., will receive bids until January 15 for either one or two vertical triple expansion condensing crank and fly wheel pumping engines, with appurtenances, for the Quackenbush street station.

The General Electric Company, Schenectady, N. Y., has been awarded a contract to equip the Ocean Shore Railway Company, which will build an electric railroad from San Francisco to Santa Cruz. The contract includes all power stations, 160 car motors of 125 horse-power each and accessories. A power house will be built at Balboa, on Half Moon Bay, and the plant there will include five 600 horse-power Babcock & Wilcox boilers, which have been ordered.

Proposed Ship Canal.

A plan to build a ship canal across that part of Jersey City forming a neck of land between Newark Bay and New York Bay is part of a scheme of the New Jersey Terminal Dock & Improvement Company and its allied companies to establish a manufacturing city on the Hackensack Meadows, with an advantageous water front on Newark Bay. The canal will be constructed along the route of the Morris Canal and it will facilitate the shipping interests of Newark, inasmuch as ocean going vessels will avoid a detour of several miles around Jersey City through the channel connecting the two bays. The plan is to be put through in connection with the schemes of the New Jersey Terminal Dock & Improvement Company, which owns several thousand acres of meadow land lying between the Hackensack and Passaic rivers, extending from Harrison, N. J., to the west bank of the Hackensack River, opposite Jersey City. The construction of the canal will necessitate a large expenditure for machinery equipment and construction material. The interests controlling the ownership of the meadow property are identical with those of the Federal Construction Company, which has a contract for deepening the Buttermilk Channel in New York Bay and for dredging a large area of the Newark Bay. The excavated material is being used to fill in the property owned by the New Jersey Terminal Dock & Improvement Company and that will be offered for sale for factory sites.

The Hudson Street Railroad Company and the Hudson Companies are also identified with the movement, and the former corporation is securing franchises for an extensive trolley system to operate throughout Hudson County. It is said that a large power house will be built on the land which is being filled in and the trolley lines will extend through that section. The Pennsylvania Railroad Company has purchased property paralleling its line across the meadows and will help the scheme along to the extent of increasing its track facilities at that point. A bill has been introduced in Congress providing for the construction of the deep water canal, and officers of the company say as soon as it is passed work will be commenced. The property will not be offered for sale until it is filled in, and it is expected that the ship canal will be built by the time the land is ready for occupation. The directors of the New Jersey Terminal Dock & Improvement Company are Pliney Fisk, William N. Barnum, William C. Lane, Charles T. Barney, George R. Sheldon, W. G. Oakman, Andrew Freedman, Anson M. Bangs and William C. Kinney. The officers are: W. G. Oakman, president; Anson M. Bangs, vice-president; Frederick W. Walls, treasurer, and Charles G. Van Anglen, secretary.

The Nicaraugua Finance & Improvement Company and the United States & Nicaraugua Company, both of which have concessions in Nicaraugua for the construction of extensive railroad systems and for the development of other extensive projects, are negotiating with a view to combining under the title of the Nicaraugua Concessions Company. The new company will take over the mineral, water and timber interests in the three Northwestern States of Nicaraugua, as well as extensive railroad rights in that section. The concession zone now controlled by the two corporations covers more than 10,000,000 acres, and some extensive industrial projects are already under way there.

The Lewisohn Exploration & Mining Company was incorporated in New Jersey last Friday with a nominal capital of $5000. The incorporation of the company is part of a plan for the formation of a new $50,000,000 mining company, and under the title adopted will be merged copper and mining companies in which the Lewisohn Bros. are interested. The Tennessee Copper Company, which is controlled by the firm, will be used as a nucleus about which the companies will be merged. Martin Vogel, 170 Broadway, New York, is attorney for the Lewisohn Bros., and he is authority for the statement that the combination of copper interests is under way, but the details are not yet ready to be made public.

Business Changes.

The Blaisdell Machinery Company, Bradford, Pa., has opened sales offices at 120 Liberty street, New York, and 707 and 708 Lincoln Trust Building, St. Louis, Mo. The St. Louis office is in charge of J. A. Prescott, Southern manager, and the New York office is under the management of A. H. Valiquette.

The Chapman Ball Bearing Company, Boston, Mass., will establish a New York office on February 1 at 138 Liberty street.

The Pittsburgh office of the Vulcan Foundry & Machine Company, works at New Castle, Pa., has moved from 208 Wood street to room 718 House Building.

The Nathan Mfg. Company, New York, is now sole agent and distributor in the United States for the products of the Coale-Muffler & Safety Valve Company, Baltimore, Md. The negotiations which were closed a few days ago led to the report that the Coale-Muffler & Safety Valve Company had been purchased, but this is denied by the Nathan Mfg. Company.

The Marinette Gas Engine Company, Chicago, has opened an office at 85 Liberty street, New York, with H. G. Tuckerman in charge.

P. Hollingsworth Morris, Philadelphia, Pa., has admiited his brother, A. Saunders Morris, to partnership, and the firm will hereafter be known as P. H. & A. S. Morris, and will continue the business of machinists.

Philadelphia Machinery Market.

PHILADELPHIA, PA., January 9, 1906.

The past year has been one of the most satisfactory that the trade in this territory has ever experienced. Every branch has profited by the improved conditions which have characterized the market and many manufacturers have exceeded by far the volume of business transacted during any previous year.

In many ways the business during 1905 has been peculiar. There was a constant flow of orders through almost the entire 12 months; at times there were spurts when some equipment of extraordinary size was placed, but this was not frequent and the year might almost be characterized for its lack of large propositions. Boom features were notable in their absence. The greater volume of trade was made up of a steady run of small orders—not small from a monetary standpoint, but rather in number of tools ordered at the time. Sale after sale was made on specifications covering but two or three tools—and frequently but one at a time—the aggregate number of such sales, however, reaching a total value which in cases exceeded alone the business of the previous year.

Manufacturers as a rule entered the year with a fair volume of business on their books, which increased rapidly as the year advanced, and before midyear had been reached deliveries were in some instances hard to get promptly. The question of deliveries ultimately became the most important feature in the placing of an order, price being frequently eliminated; the question of how soon the required tool could be delivered governed the placing of the business. In many cases manufacturers now find their capacities on certain lines and sizes of tools so fully taken that orders requiring deliveries inside of six months could not be accepted.

The general prosperity of the country, its ability to absorb the production of manufacturers of all kinds and the confidence in the conduct of public affairs have done much to perpetuate present prosperous conditions, which, judging from indications, will no doubt continue uninterrupted during the coming year.

Manufacturers have handled their affairs during the past year in a conservative manner, and while the present capacities of plants are evidently inadequate for the demands made upon them there is considerable hesitation when it comes to the question of enlarging or of building new enterprises to meet the present requirements. The recollection of the extended period of inactivity which followed the era of plant building in 1902-1903 is still fresh, and some manufacturers contend that it is better to handle a smaller volume of business to-day than it might be to take care of a large plant at a future date when orders might not be as plentiful. While there have been a number of exceptions to this, the condition explains in a measure the absence of specifications for large plant equipments which were so extensively before the trade a few years ago.

The continual driving of plants to their fullest capacities means good conditions for the tool builder. Machinery driven continuously at its maximum power soon wears that particular tool or machine to a point where its efficiency is impaired and a new one becomes necessary in order that it again may be operated at its limit to produce the necessary amount of work. These conditions have been clearly evidenced during the past year by the purchase of many tools for replacement. Minor plant extensions have taken a large quantity of tools, as has also the establishment of automobile repair shops throughout the country.

Steam and electric railroad work has been an important item in the year's trade and the local railroads have been heavy purchasers of machine tools for equipment of their various shops. Their trackage and terminal facilities have been largely augmented and plans for the coming year include large expenditures for still further improvements. The heavy buying of motive power and rolling stock by the railroads is to be noted, and further purchases are expected to be made to meet the demands of increased transportation. The electrification of certain portions of steam roads and additional electric lines have brought out extensive purchases of engines and machinery for power purposes, as well as general equipment of interest to the machinery trade.

The supply of raw materials throughout the year has been good, the demand for pig iron and fuel has been large and producers have generally been able to supply the demand. Prices of pig iron have advanced considerably and those for coke have been subject to more or less fluctuation. Steel products have increased in price, as have also most of the other materials entering in the manufacture of tools and machinery.

Traffic arrangements on the railroads have not been so free in years and the ability to handle freely the enormous tonnage, not only of raw materials but finished products offered, has materially aided deliveries.

The Export Trade.

Export business throughout the year has been more or less inactive. The sale of machinery and tools during the early portion was not so large as was expected, and later, when domestic business became so extensive, manufacturers did not seem particularly anxious to go out of their way to secure foreign orders. The costs of raw material, together with the high wages paid labor, make it difficult for the manufacturer in this country to obtain a very large share of this business at a profit when in competition with foreign makers, and when the home consumption is so large that deliveries cannot be made for months at a time there is little incentive for the manufacturer to reach out for the export trade. Some exceptions, however, are being noted. More or less business of quite a satisfactory nature was transacted early in the year, most of which emanated from the Russo-Japanese War. After this trade dropped off the market became less active and no large business of moment was transacted. Some manufacturers have built up quite a large trade in specialties, but even this business has not been as active on the whole as it was during 1904.

Conditions abroad, particularly on the Continent, have not been conducive to good business. Internal dissensions have at times caused periods of depression which affected not only our trade abroad but also their own domestic interests. What the present year will develop in the way of foreign

business is problematical. An improvement, however, is anticipated. Japan since the closing of the Russo-Japanese conflict is forging slowly ahead, while Russia is hampered with internal dissensions. Considerable business, however, is looked forward to from these countries in the future and it is hoped that it will be at no very distant date.

The Machine Tool Trade.

Conditions in this branch of the trade have been prosperous almost throughout the year. Manufacturers entered the year with a fair margin of business on their books and as the year advanced the demand increased, and before midsummer many plants had more orders on their books than they could conveniently take care of.

During the summer months business continued to come forward without abatement, and before the advent of fall so many orders had been placed that deliveries within a reasonable period were unable to be had. On some lines of tools manufacturers refused to guarantee deliveries for three, six and in extreme cases nine months' time. Plants have been kept in continuous operation, in many cases on double time, in order to meet the demand, but have been unable to catch up on their orders. This condition has affected large and small plants alike, and all have transacted a large volume of business. While the demand has kept up well and has covered a wide range of tools there has been a particularly good market for those of the heavier types, such as lathes, planers, boring mills, &c., for use in the large steel and iron working plants. Large special tools and those of the hydraulic type have also been in good demand. Medium size tools have been sold to a large extent to a variety of purchasers, and stocks of nearly all classes of machinery and tools are the smallest that have been carried for years. Dealers have had a most satisfactory year, finding ready sale for nearly all classes of tools. The inability of makers to deliver tools promptly not only hampered sales but also made it impossible for the dealers to get stock for display purposes on their floors.

Heavy Engines and Locomotives.

Builders of heavy engines for power purposes have had a prosperous year. Central power plants are increasing and the demand for engines of this class has materially improved. Business was fairly well distributed throughout the year and manufacturers have about all they can do at the time to meet the demands of their customers. Locomotives have been in extraordinary demand. The railroads have been placing orders with manufacturers for large numbers of engines and the local locomotive plant has been operating at its utmost capacity almost throughout the entire year in order to meet the demand for delivery. This company, the Baldwin Locomotive Works, exceeded all previous records during the past year for finished engines turned out, reaching a total of 2265, which exceeds its best previous record, which was for the year 1903, by 243 locomotives. It now has orders on hand for engines to be delivered throughout 1906 which would collectively aggregate over six months' work at the full capacity of the works.

Boilers and Engines.

The demand for boilers and engines has been generally good. Early in the year there was but little business transacted in either line, but as the year advanced the market improved, boiler makers taking probably the greater proportion of the business, and particularly those making the higher powers, who for some time have had more business on hand than they could conveniently handle. The smaller engine and boiler makers, however, have on the average not taken as much business as they would like, the market being dull and spotty for extended periods at different times during the year. The weakening demand for engines and boilers of, say, under 50 horse-power may be partly explained by the heavy sales of gas and gasoline engines of like power, which have replaced boilers and engines in many of the smaller manufacturing plants.

The Smaller Machine Tools.

Sales of the smaller machine tools, such as lathes, drill presses, &c., have been fairly good throughout the year. There has been a scarcity of some lines and sizes. Manufacturers making these tools in connection with those of the heavier types have had so much business in the latter line that they have been unable to get a full complement of the smaller tools made and deliveries have therefore been almost as hard to get as in the medium and larger sizes.

Shipbuilding.

There has been a much better demand for vessels of various types and the Delaware River shipyards have had a very active year. Orders have been received for a number of war vessels for the Government, merchant vessels both for passenger and freight purposes and steam vessels for inland water service. Several of the yards have been continuously operated at their best capacity for months past and have work enough on their books to keep them fully occupied for a long period. The outlook therefore for 1906 is highly satisfactory, as with the work already in hand and that certain proportion which annually develops the yards are assured of a continuation of the present activity for the coming year at least.

Iron and Steel Foundries.

Iron and steel foundries have had a very active year. At the beginning of 1905 conditions were scarcely all that could be desired, but there was a constant improvement in the demand and before midyear it was difficult to obtain prompt deliveries on contracts of any size. The jobbing foundries working in gray iron were not as active generally as were those working in heavy machinery or building work. Steel casting plants have been continuously busy and have been unable during the greater portion of the year to meet the demands of their customers for deliveries of castings. Steel foundries in this territory have not greatly increased their facilities during the past 12 months. Some extensions to plants have been made, but no new ones have been erected, while one, the Delaware River Steel Casting Company, Chester, Pa., has gone out of business.

There has been a considerable increase in the productive capacities of gray iron foundries. New plants have been built and capacities of a number of the older foundries have been more than doubled. While the largest increases have been by manufacturers of machinery and general castings, a number of the stove manufacturers have made material additions to their melting capacities. Business in the latter line has been unprecedented and the production of stove castings has been the greatest in the recollection of the trade. Labor troubles have interfered to some extent in the operation of gray iron foundries. Most of the difficulties were of a minor character and were speedily settled. During the closing months, however, a strike of some importance affected nearly all of the local gray iron foundries. Advances were asked by the core makers which were not granted by the foundrymen. A sympathetic strike on the part of the molders followed, and while some of the plants were temporarily idle they have since resumed operation on the open shop basis, and although handicapped to a certain extent are now getting out a fair tonnage.

Raw materials have been in good supply throughout the year. Prices for castings have improved and the trade generally has transacted a satisfactory amount of business.

Improvements to Plants.

While general business conditions appeared to warrant the extensive improvement and enlargements of manufacturing plants in order to meet the growing demand for machinery and tools, careful consideration was given the matter before anything on an extensive scale was undertaken. During the boom period of several years ago plants were extended and built on a large scale, but with the decline in business which followed manufacturers learned by experience the difficulties of maintaining these large plants in operation with a minimum amount of business on hand. In view of this experience there has been a tendency in a number of cases during the past year to avoid further increases at the time. In other cases enlargements were absolutely necessary and were made in accordance with good business policy. The railroad companies have made extensive improvements to their various shops. The Pennsylvania Railroad built new shops at Trenton, N. J., and increased its present shops at Philadelphia, Wilmington, Altoona and Harrisburg. The Philadelphia & Reading Railway at its Reading shops made extensive enlargements, while smaller ones were made at the local plants.

The Midvale Steel Company in this city has greatly increased its facilities for the manufacture of armor plate and also made many other improvements to its plant in general.

Some of the machine tool builders also made important improvements, notably the additions of the Newton Machine Tool Works in this city. The Standard Roller Bearing Company, which made a number of improvements to its plant during 1904, has made even more extensive ones during the past year. The Baldwin Locomotive Works has made a number of extensions to its plant, the most important being the new truck shop now in course of erection. Many of the textile manufacturers have made large extensions and some new mills have been erected, the most important of these being the new plant of the Lehigh Mfg. Company, which will cost with equipment something like $3,000,000.

In addition to these general improvements minor extensions have been made in a majority of the local manufacturing plants, and as a rule builders of machinery and tools are better equipped than ever before for prompt and efficient manufacture of their various products.

Prices.

A more or less regular advance in the prices of machinery and tools has been made during the past year. Low prices prevailed during the latter half of 1904, prompted in many cases no doubt by the desire for business at that time. As business increased early in the year prices stiffened and were fairly steady until the demand for tools became so large that manufacturers could not make prompt deliveries, when advances were made on some lines. As the price of raw materials advanced builders of tools found that it was impossible to manufacture tools at the same costs and fur-

ther advances, varying from 5 to 10 per cent., were announced. Later in the year it became a case of how soon a tool could be delivered rather than what the price would be.

Manufacturers have contended that with the present cost of raw materials and high rates paid labor a fair margin of profit was not being made at even the prices during the late months of the year, and a more concerted action of tool makers resulted in another advance of prices varying from 5 to 15 per cent., according to the class and size of the tool, in some cases being immediately effective, in others after the first of the year. It is probable that these prices will stand for some time, but should raw materials or other costs of manufacture continue to advance the prices of tools will naturally go to higher figures.

The Outlook for 1906.

It is the general opinion that prosperous conditions will prevail during the coming year. In many instances business already booked is sufficient to keep plants operating from four to six months at their best capacity, and while it is hardly possible that a great volume of business will be placed during January, particularly when the amount placed during December is taken into consideration, and which would under ordinary conditions have been deferred until after the turn of the year. There is, however, enough business in contemplation which, when placed, should enable those in the trade to have each a generous share. The railroads, both steam and electric, expect to continue during 1906 the present plans for improvements.

Many industrial projects are expected to reach a definite conclusion and will both directly and indirectly benefit the trade in many ways. The general business of the country is on a sound basis and every indication at the present time points toward continued prosperity.

Manufacturing plants alone will require a large amount of tools and machinery for replacement, and many new fields for consumption of tools and machinery are constantly in course of development. Labor appears to be satisfied with existing conditions in the machine shop, and in instances where difficulties have been encountered no great trouble is anticipated in bringing about satisfactory relations. On the whole, therefore, the year 1906 should be fully as prosperous as the past one has been, even if not more so.

The Week.

More business has been transacted in this territory since the first of the year than was generally anticipated. As a rule but little business is transacted during the early weeks of January, and it was further expected this year, in view of the extensive purchases made during the late weeks of December, that there would be more or less inactivity during the present month. Inquiries for small lots of tools for extension and replacement are the leading features in the market. Some small lists for tools for the Chesapeake & Ohio and the Norfolk & Western railroads have been received by the trade, most of the tools required being for distribution among their various shops. The Standard Roller Bearing Company is placing orders for the equipment of its new shops, while the Baldwin Locomotive Works and several other plants are constantly placing orders for small numbers of tools.

Deliveries are not improving. In some cases they are becoming more extended, and, with manufacturers covered in instances for their output on many sizes for full six months ahead, it is difficult to see how they will be greatly improved, at least until after midyear. Manufacturers have so far this winter been favored with open weather conditions and have been greatly aided thereby in forwarding shipments to their purchasers. Should weather conditions, however, become unfavorable and interfere with the free movement of transportation, additional delays in delivery may be expected.

The foreign demand has been particularly inactive since the first of the year, but this is usually the case at this season, little business being expected until after the annual stocktakings, when both buyers and sellers are able to formulate their plans for the present year.

There has been a better demand for second-hand machinery and tools, as well as for the smaller boilers and engines during the past few weeks, and this branch of the trade is taking on a more active appearance. A considerable amount of buying, particularly as far as machine tools are concerned, is no doubt due to the inability of manufacturers to make deliveries on new tools, and buyers are picking up second-hand ones to help them out until they are able to obtain new ones, orders for which in cases have already been placed.

The foundry trades are very active, and are having more work offered than can, in many cases, be handled. Steel casting plants have taken on some extensive business, and the amount still available is in some instances greater than the amount closed. Gray iron foundries are still handicapped to a certain extent by labor difficulties. While all the plants recently affected are now in operation, a number are not working up to anything like their full capacities. This condition has caused more or less delay in the delivery of castings, and machinery builders are consequently further delayed in deliveries of tools.

The Philadelphia branch office of the Dodge Mfg. Company, Wishawaka, Ind., power transmission engineers, will remove from 426 North Thirteenth street to 535 Arch street, where better facilities are available.

The Caldwell Process Foundry Company, a new corporation, was formed under the laws of the State of Delaware, January 3, with a capital stock of $500,000. It will make castings in permanent molds under the patents of Henry C. Caldwell, using temporarily a portion of the foundry of the Isaac A. Sheppard Stove Company. Arrangements are so far advanced that the new company will be turning out castings by February 1. Franklin L. Sheppard is president and J. W. Daniels, 753 Bourse, secretary of the company.

The Harlan & Hollingsworth Corporation, Wilmington, Del., has let the contract for its new car shops to Tatnall, Brown & Co. of the above city. The shops will be one story high, with lantern, round house type of construction, with a capacity of 15 80-foot cars. The outer circle of the building measures 450 feet; the inner, 220 feet; width of the building is 90 feet. A two-story storehouse, 40 x 48 feet, is also to be erected in connection with the above building.

The Pennsylvania Salt Mfg. Company will erect a new building at its Greenwich plant, Delaware avenue and Porter street, for the manufacture of sulphuric acid. It will be of steel and corrugated iron construction, 130 x 230 feet, 40 feet high to the eaves. No equipment other than what the company makes itself will be required.

The Hess Machine Works, manufacturer of file making machinery, notes a particular increase in the domestic demand, orders for a number of machines having been taken. The foreign demand keeps up well. One set of machines is to be furnished parties in Russia and a number of sets are to be shipped to Japan. The final shipment of a large order to Switzerland was made by this concern during the past week.

The Newton Machine Tool Works received more orders for tools during the month of December than in any previous like period, the demand for cold saw cutting off machines, slotting machines and rotary planers being particularly good. Future business also has a most favorable appearance and some extensive orders are anticipated early in the present year. Orders for four No. 1 steel foundry saws for the Standard Steel Works, two of a like type for the Baldt Steel Casting Company, New Castle, Pa., and one for the McClintic-Marshall Construction Company for its Calumet, La., plant are to be noted, while a heavy rotary planing machine is also to be furnished the latter for its Pittsburgh plant. A large gear cutter has been ordered by the General Electric Company for its Schenectady plant, while a Western bridge company has placed orders for rotary planers, cold saws and chord boring machines.

Wickes Brothers, who have recently removed from the Bourse to 605 and 607 Arch street, have been appointed agents for the I. & E. Greenwald Company, engine builders, Cincinnati, Ohio, in New York, Philadelphia and Boston. They have also taken on the representation in the Philadelphia district of Brownell & Co., Dayton, Ohio, manufacturers of boilers and automatic high speed engines. They have had a good demand recently for air compressors and other appliances, the sales including a 14 x 15 x 14 compressor delivering 375 cubic feet of free air per minute to the Duplex Metal Company, Chester, Pa., and a smaller one delivering 110 cubic feet of free air per minute to the Pennsylvania Marble & Granite Company, Baker, Pa. A 16 x 36 improved Greenwalk engine and a 1000 horse-power feed water heater have been sold to local consumers.

The Philadelphia Rapid Transit Company has nearly completed its machine shops, repair and blacksmith shops being erected at Sixty-seventh and Market streets for the repair of elevated and surface car equipment. The construction of the elevated railway on Market street is now progressing favorably and is expected to be completed by May 1. Permits for further work on its underground system in and about the City Hall have been taken out, and this work is expected to be pushed forward as rapidly as possible.

The Baldwin Locomotive Works has recently purchased additional property on Buttonwood street, extending from its new truck shop, now building, to Eighteenth street, and will erect thereon an addition to the truck shop, doubling its size. The machinery requirements for these shops have as yet not been fully decided upon. These works during 1905 made a new high record in production—2250 locomotives have been built. It was expected that this number would be increased by 15, but delays at the last moment interfered with their completion. Of the above number, 140 were electric locomotives and 115 of the compound cylinder type. Four hundred and six locomotives were built for export, principally for Japan, Australia, Sweden, Africa, Hawaii, Cuba, Mexico and various South American countries. Orders for locomotives are continually being received and sufficient business is on hand for delivery during 1906 which, if taken collectively, would aggregate over six months' work at full capacity.

Cincinnati Machinery Market.

CINCINNATI, OHIO, January 9, 1906.

Looking backward over the year's work in the machinery line one can scarcely fail to recognize the fact that in many respects it has been one of exceptional opportunity. The year preceding was a very bad one for the machine tool industry, and it is scarcely fair to draw comparisons with a normal year, much less with the largest year ever known in the history of the machine tool business. From a domestic standpoint industries have developed along numberless lines, while conditions abroad have been such as to demand the most strenuous efforts on the part of manufacturers to meet the requirements. Reports indicate that there is an exceptional demand for machine tools in this city at the present time, a number of the factories working until 8 and 9 o'clock at night.

The contemplated trade with Russia is absorbing the attention of most of the manufacturers, who are anxious to see an end of the present internal troubles, knowing full well that when this time arrives Russian commercial pride will assert itself and the rebuilding of shattered industries will naturally follow. It seems to be the opinion of those who are in a position to know that our manufacturers should be very cautious in making agency arrangements and allowing credits in that country owing to the unsettled conditions, as firms who were rated very high a few years since have had their credit seriously impaired by losses due to strikes, &c. Some months since we made mention of the new duty that went into effect on September 15, which was in the nature of a reduction on American machines from 3.31½ to 2.14 rubles per pood. We are advised that this new rate will only hold good until the new tariff between Russia and Germany goes into effect, which will probably be March 1. The duty on American machinery will then be raised to 4.20 rubles per pood, which means 0.89 ruble higher than it was before the recent reduction. We are informed, however, that the same duty will apply on machines of German manufacture, and as both countries will thus be placed on an equal footing competition will not be felt so keenly as before.

The year has been comparatively free from all labor troubles and skilled machinists have found little difficulty in securing employment. The only menace to an exceptionally sound and prosperous future is the price to which labor is trending. Aside from this 1906 promises wonderful things. The country at large is shown to be in a most prosperous and flourishing condition, and it is but natural to draw the inference that the machine tool builders have realized their share.

The matter of an advance in prices is being considerably agitated and from what can be gathered it looks as though a majority of manufacturers have raised the schedule from 5 to 10 per cent. With the price of labor at a high level and prices of raw material by no means low, it seems but just that their product should be placed on a paying basis, bringing in a fair return on the investment.

Structural development in this city during the past year has surpassed all previous records, and the tonnage that went into these new buildings was very considerable. In addition to this the railroads have made numerous improvements along the river bank, erecting bridges, overhead tracks and freight houses of such magnitude as to keep the structural people very busy.

One industry that is taking the attention of the machine tool builders at present is the establishment of a new steel castings plant in the suburbs. It has long been a recognized fact that an industry of this kind was very necessary to the further development of the machinery interests. A portion of the machinery we understand is still held in abeyance, particulars of which may be secured from Secretary Wm. Finch of the Industrial Bureau.

As an indication as to how the year's business has resulted we give below reports from a number of manufacturers, which it is hoped will be of interest to the trade generally:

The John Steptoe Shaper Company: "Our business this year was 25 per cent. larger than that of 1904. We have placed in our shops considerable new machinery and thrown out a number of the old machines. During 1906 we expect to increase the output of our plant 50 per cent. by the addition of more machinery. Our equipment has been entirely inadequate to supply the demand for our machines and this will compel us to make some additions to our machinery during the first six months of the year. The indications for 1906 are very favorable, as we now have six months' business on our books and are quoting June and July delivery."

The Cincinnati Shaper Company: "We have every reason to be satisfied with the trade situation of the past year. While we had a very satisfactory business in 1904, the past year will very materially exceed it, demanding the addition of a number of tools. We have also added to our plant a castings storage shed 40 x 80 feet, thus giving us more room in the shop proper. We anticipate that the year of 1906 will be a most satisfactory one."

The Rahn-Mayer-Carpenter Company: "The present situation is quite flattering and we have every reason to look forward to a good business all of next year. We are so confident of this that we have added quite a number of new machines, and will continue to add still more, that our output may be increased. In addition to home trade we are having quite a nice foreign trade and are from 90 days to four months behind on some sizes of our machines."

The John H. McGowan Company: "There is no let up to business and we are forced to work overtime to keep up with our orders. Although we have doubled our factory facilities we find it necessary to make further additions and have now added the adjoining plant, formerly occupied by the J. M. Robinson Mfg. Company, which will afford much needed relief in this direction. Business for 1905 shows a large increase over that of the previous year, and from present indications it looks as though 1906 would be equally as good."

Cincinnati Machine Tool Company: "The year 1905 compares most favorably with the previous year, the increase in business having been quite large in both foreign and domestic fields. This is the first year in which we received the full benefit of a year's business in our new plant, to which we have added considerable in the way of equipment from time to time. Our line of machines has undergone quite a number of changes and improvements during the year, with still further changes contemplated. We have erected an additional building for carpenter shop and storage of lumber during this period, as well as several improvements. Present indications point to a good business during 1906."

Smith & Mills: "The trade situation for the past year has far exceeded our expectations. Up to September 1 our output was greater than the whole of 1904, and taking the entire year it will give us a gain of 40 per cent. over last year's business. We are sold up to June 1 and the prospects look bright for 12 to 18 months of good trade. We have increased our factory space 7500 square feet and have added $12,000 worth of new machinery of very latest type since September."

The Hisey-Wolf Machine Company: "The demand for portable electrical driven tools has increased wonderfully and our past year's business has been exceptionally large and gratifying, almost doubling that of 1904. Our orders have been coming from all sections of the United States, showing a healthy condition and good demand. Our foreign business has been especially large in England and Continental Europe. We can also report an increased shipment to South America, Australia, South Africa and the Far East. We moved into our new shops in January, 1905, which gave us considerable more floor space than formerly. We have also added considerable in the line of new equipment and now have an up to date plant in every respect. We think the conditions are good all over the country. There is a healthy demand for tools, without being in the nature of a boom, which we think a most satisfactory state of affairs. We are looking forward to a still better year during 1906."

Schumacher & Boye: "Our business in 1905 was the largest we have ever had and the prospects for 1906 are still better."

The American Tool Works Company: "The volume of business transacted in 1905 has been a great deal larger than 1904; in fact, our capacity has been taxed to the utmost. The increase in the wage rate and the increased cost of the various materials entering into the construction of machine tools have not, however, been offset by a sufficient advance in the selling prices to render a legitimate profit. We believe that this will be at least partially corrected during the coming year. The prospects for the machine tool business of 1906 seem to be exceedingly bright and we look for even a larger volume of business than in 1905. Consequently we have added about 8000 square feet additional available floor space and have installed about $30,000 worth of new equipment, so that we expect to be able to take care of a larger volume of business."

The King Machine Tool Company: "The current year has shown a gratifying advance in business over the year 1904 and we expect a greater volume of business in 1906. Our expectations are based on the steady monthly increase in orders, to meet which we are adding to our shop, the addition to be ready for occupancy May 1. We have already added about $15,000 to our equipment, which will be augmented later."

The Dreses Machine Tool Company: "Business at the beginning of the year with us was good, although we did not work full force until about April. Since that time we had not only orders enough on hand to work to full capacity, but we were compelled to let a number of them go on account of the delay in deliveries, which condition prevails to-day. We made no additions to our present plant during the year for the reason that we contemplate building a larger plant in the near future. A number of new machines have been added to the equipment, which has increased our facilities greatly. The scope of our product has been increased by our line of Simplex radials, which we are building

in conjunction with regular radials. We also augmented our line of screw and turret machines by adding a 20-inch full universal monitor. The outlook is extremely good, and if no special or unforeseen disturbance occurs we expect to see one of the most prosperous years in the iron and steel business ever experienced in the United States."

Greaves-Klusman & Co.: "During the year we considerably enlarged our works and added a large number of up to date tools. This was necessary to meet the constantly increasing demand for our line of standard engine lathes and pattern makers' lathes, &c. The year 1906 promises to be a most successful one and we are in a better position than ever to make satisfactory deliveries."

Diamond Chain & Mfg. Company, Indianapolis: "Trade conditions are excellent, our business this year showing a decided increase over that of last year, due to the general prosperity in the machinery manufacturing business. Our product is now largely used as a method of power transmission."

The Foos Mfg. Company, Springfield, Ohio: "Our business this season shows a comfortable increase over the business of a year ago. Some months this increase has been as much as 40 per cent., and at no time has it been less than the corresponding month of a year since. From the present point of view business for the future seems very encouaging."

The Springfield Machine Tool Company: "Business with this company has been most satisfactory in every respect. Our books are well filled with orders and deliveries cannot be made at present under six to eight weeks. While domestic trade is remarkably good and inquiries are exceptionally brisk, we are enjoying a very large foreign business, perhaps the largest that we have known in the history of the company, nearly three-fourths of our output at present being sent to Europe. While we are not increasing our plant in any respect we are daily adding to the number of men employed, but find that we are greatly handicapped at present by the lack of good, all around skilled machine hands."

The National Machinery Company, Tiffin, Ohio: "Although we have been working nights for the last three months we are unable to keep pace with the trade. A very satisfactory condition, which seems to be on the increase, is the demand for tools of the finest quality obtainable and the question of price, particularly in the line of bolt, nut and forging machinery, is becoming of secondary importance, which is as it should be. Foreign demand has been on the increase for the last quarter of this year and the indications are that it will continue so for some time to come. We feel quite confident that 1906 is going to be a record year, but as business conditions are on a very stable basis we do not anticipate a boom."

The Week.

Bids will be received until January 15 for the following equipment for the new $1,000,000 hotel located on the site of the destroyed Pike Opera House: Three 200-kw. direct connected generators, three 300 horse-power water tube boilers equipped with stokers, six hydraulic elevators, one complete refrigerating plant, 30-ton capacity; one high duty pump and one direct acting compound elevator pump, one complete filtering plant, one electric light plant and one steam heating and ventilating plant. The fans are to be motor driven, and all pumps in constant use to be electrically driven. Complete system of electric wiring and telephone system are to be installed. Plans and specifications are on file at Room 1605, First National Bank Building. C. W. Marx, consulting engineer.

The Cincinnati Southern Railway on last Saturday placed quite a large order for tools for its new shops now being erected at Somerset, Ky. The machinery was purchased from the Niles Tool Works, Hamilton; J. A. Fay & Egan Company, Northern Electric Mfg. Company, and Manning, Maxwell & Moore, New York. The new shops at Somerset are nearing completion, and these purchases, in addition to what tools may be removed from Cincinnati and Chattanooga, will about comprise the equipment, excepting possibly what may be considered necessary when the plant is in running order.

During the past week William Auler of Rio de Janeiro, Brazil, has been in this city securing new machinery for his furniture factory, which was recently destroyed by fire.

The Motch & Merryweather Machinery Company, successor to Marshall & Huschart Machinery Company, Cleveland, is opening a branch office in Cincinnati, in the First National Bank Building, to be in charge of L. H. Mesker, formerly general sales agent of the Allentown Rolling Mill Company, Allentown, Pa., and previously superintendent of the Gas Machinery Company, Cleveland, and general foreman of the McBeth Iron Company, Cleveland.

The International Power Company, New York, which recently secured control of the Alabama Consolidated Coal & Iron Company, has just purchased extensive ore lands in the State of Alabama.

New England Machinery Market.

WORCESTER, MASS., January 9, 1906.

Deliveries are getting farther and farther away, until a few builders of machine tools have passed the next summer mark on certain lines. It is expected that orders for 1907 deliveries will soon be talked, though naturally few will buy under such conditions, excepting where the need of additional equipment a year ahead is certain and not subject to the continuation of present conditions of business. So eagerly are certain tools sought that the market for second-hand machines of the desired type has been exhausted and recent sales of tools which have been in use for several years brought prices very close to what they originally sold for. The entire second-hand tool market has been materially affected by the demand.

The Billings & Spencer Company, Hartford, Conn., has announced an advance in the price of drop hammers amounting on an average to about 8 per cent. This change in prices was not brought about through concerted action of builders of hammers, but because of the unexpected lapse of the company's contract for castings, owing to the fact that the foundry having the contract went into the hands of a receiver. The advance is really less than the increase in cost of castings made under a new contract governed by present market conditions.

The Hartford Machine Screw Company, Hartford, Conn., has advanced prices on much of its screw manufacturing machinery. The advance does not affect the entire line, there being no change in the price of certain tools. Where the increase has been made it is about 10 per cent. This action is independent of any manufacturers' agreement.

The scarcity of skilled workmen is entering into the consideration of the season's building plans. There are machine shops in New England which are not able to utilize the full capacities of their present plants because of inability to procure the requisite labor; yet, were labor available, they would have begun large additions before now, so great is the demand for their product. But with new buildings already begun or announced as decided upon, the year will be exceptional in the increase in machine shop capacity, and much new construction is contemplated that has not yet been made public.

The Meriden Fire Arms Company, Meriden, Conn., is to erect a new building, to be used principally as a machine shop. The building will be one story and about 40 x 200 feet. One end will be used as a forge shop. The company expects to be in the market for a considerable number of machine tools for the equipment of the new shop. Another contemplated improvement is a power plant, for which engines and boilers will be required.

The Atlas Gun Company, Ilion, N. Y., manufacturer of sporting rifles and air guns, has disposed of its business. The Meriden Fire Arms Company, Meriden, Conn., has purchased the sporting rifle end of the business and is removing the machinery to the Meriden factory, where the 22-caliber rifle will be manufactured. The air rifle has been taken by the Daisy Mfg. Company, Plymouth, Mich.

The Hartford Machine Screw Company, Hartford, Conn., is to erect a new manufacturing building, one story, which will contain upward of 9000 square feet of floor area. The dimensions are not wholly decided and it may be that a considerably larger building will be necessary to afford needed additional capacity. The walls of the building will be heavy enough to support a second story, which will undoubtedly be added in the near future. The work of building will start within 30 days. The building will be devoted to general manufacturing and not to machine shop purposes.

The Wason Mfg. Company, Springfield, Mass., car builder, is planning to begin the building of freight cars on a large scale. The business is an old one, but hitherto has been confined to the building of passenger and electric cars, excepting for a few freight cars from time to time. A contract has already been taken for 500 freight cars for the New York, New Haven & Hartford Railroad. The plant will be enlarged to give a capacity of 25 freight cars a week in addition to the already large output of passenger coaches and electrics. A new building will be erected of brick, 40 x 75 feet and two stories, and will be filled with compressed air machinery. This company has orders for about $1,200,000 of business on its books, including large South American contracts.

The business of B. M. Jones & Co., 141 Milk street, Boston, and 143 Liberty street, New York, has been incorporated in Massachusetts, with the following officers: President, Benj. M. Jones, Boston; vice-president and general manager, James A. Warren, Chicago; second vice-president, Richard L. Thomas, New York; secretary and treasurer, Walter J. Klein, Boston. The company will act as sole representative in the United States, Canada and Mexico of Samuel Osborn & Co., Clyde Steel & Iron Works, Sheffield, England, manufacturer of the Mushet steels, Mushet steel twist drills and cutter blanks and Clyde tool steel, and in the same capacity for the same territory for Taylor Bros. & Co., Limited, Clarence Iron Works, Leeds, England, manufacturer of Taylor Yorkshire iron.

The business of Warren F. Fraser, 51 Chardon street, Boston, manufacturer of special automatic machinery, has been incorporated under Massachusetts laws with capital stock of $12,000. The officers are: President and treasurer, W. F. Fraser; secretary, R. J. Murray; directors, these officers and W. Mabry and D. A. Barber. The feature of the business is piano action machinery.

The Geometric Tool Company, New Haven, Conn., manufacturer of special machinery and tools, is having plans prepared for a large factory building adjoining the present plant at Westville and which when completed will a little more than double the company's present capacity. The new building will connect the office building with the main factory and will be 38 x 180 feet and three stories. The company is now erecting an addition 34 x 60 feet which, it is planned, will be used as a stock room until after the larger building is completed, when it will probably be converted into a power house. Plans are not yet fully matured, and consequently the company is unable to give definite information as to machinery requirements. In fact it will probably be two or three months before plans will be entirely matured.

The Bannatyne Watch Company, Waterbury, Conn., recently organized to manufacture a low price watch, has leased quarters in the Cross & Spiers shop on Canal street and manufacturing operations will begin as soon as possible.

The Brown & Sharpe Mfg. Company, Providence, R. I., is rushed to the full capacity of its enlarged works. There are now about 3500 on the payroll, and more skilled workmen would be employed if they could be obtained.

The Luxemoor Company, a new corporation, which will manufacture leather goods at Vineyard Haven, Mass., will be in the market for a 40 or 50 horse-power electric plant. A building 30 x 100 feet and either two or three stories will be built.

The Stanislaus Electric Company has been incorporated in Connecticut to develop water power on the middle branch of the Stanislaus River in California. The company proposes to develop electric power for sale for power purposes. The officers are: President, John C. Rice; vice-president, E. H. George; treasurer, Nathaniel Anthony; secretary, H. W. Palmer, all of Boston. Tucker, Anthony & Co., bankers, Boston, are financing the company.

The business of Wyman & Gordon, Worcester, Mass., and Cleveland, manufacturers of drop forgings, has been incorporated in Massachusetts with a capital stock of $300,000. It will be known as the Wyman-Gordon Company, The officers are: President and treasurer, Lyman F. Gordon; clerk, George F. Fuller; directors, these officers and Horace Wyman, who represents the estate of the late H. Winfield Wyman, one of the founders of the business. The incorporation means no change in the policy of the management.

J. W. Carrel, well known in the machine tool trade, has associated himself with Hill, Clarke & Co., machinery dealers, Boston, with whom he was connected as a salesman for a number of years previous to his going to the Draper Machine Tool Company, Worcester. Mr. Carrel has been with J. J. McCabe, New York, for a short time, since the Draper Company sold out to the Whitcomb-Blaisdell Machine Tool Company, and now returns to his old association and to his old territory, for he will cover Connecticut as formerly. He will make his residence and headquarters at Boston. Albert R. Steadfast, who has been taking care of Connecticut since Mr. Carrel left the firm, will have Boston and vicinity as his territory.

The Prentiss Tool & Supply Company has made extensive improvements to its Boston store, 143-145 Oliver street. Space which had been let to another company has now been taken, together with the basement, giving 3500 square feet of additional floor space, besides a spacious new office. Appliances will be installed for easy handling of machinery placed in the basement. A demonstration room will be fitted up where customers can be shown machine tools in operation. The company's Boston store is in charge of William F. McCarthy as manager.

The Howe Scale Company, Rutland, Vt., is erecting a new building, 50 x 80 feet and three stories, for manufacturing purposes. The company states that most if not all of the necessary machinery has been purchased.

The American & British Mfg. Company, Providence, R. I., is preparing to put on the market the Wilkinson steam turbine and the time is near at hand when the new turbine will be presented to the trade. The company is making extensive improvements to its Providence works in installing a large amount of new machinery, replacing old tools and in rearranging the shops devoted to the manufacture of Diesel combustion engines, for which the new machinery is intended. These changes have been made necessary by a greatly increased demand for this type of engine. The company is to build a new erecting shop for the ordnance department of its Bridgeport works, filling in space between existing buildings. The structure will be of brick, 34 x 150 feet, one story, with cement roof.

The International Silver Company, Meriden, Conn., has decided to occupy the plant in that city now leased to the J. D. Bergen Company, manufacturer of cut glass. The Bergen Company will erect a plant of its own, but will probably be unable to move before July 1. The International Silver Company will devote the building to its sterling silver department.

The Nathaniel Tufts Meter Company, 8 Medford street, Boston, is to erect new works at 453 Commercial street. A fire proof building is planned.

Government Purchases.

WASHINGTON, D. C., January 9, 1906.

The Bureau of Supplies and Accounts will receive bids until January 16 for a lathe, pneumatic tools, gib crane, electric hoist, and other supplies, for the Eastern navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 6 for the following machine tools for the Boston, Norfolk and New Orleans navy yards: Trimming press, steam hammers, band saw, speed lathes, engine lathe, glass grinding machine, jib cranes and a nickel plating plant.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 6 for a quantity of supplies for Mare Island and Puget Sound navy yards, including hydraulic pump, &c.

The Isthmian Canal Commission will receive bids until January 23 for five kilowatt engines and dynamos.

The Isthmian Canal Commission will equip tin and copper shops on the Isthmus of Panama and will soon ask bids for the necessary machinery.

The following bids were opened December 26 for supplies for the navy yards:

Bidder 2, Alliance Machine Company, Alliance, Ohio; 3, American Ship Windlass Company, Providence, R. I.; 12 Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa.; 25, Case Mfg. Company, Columbus, Ohio; 31, Crocker-Wheeler Company, Ampere, N. J.; 35, J. W. Cregar Agency, Philadelphia, Pa.; 38, Cleveland Automatic Machine Company, Cleveland, Ohio; 46, Drew Machinery Agency, Manchester, N. H.; 55, General Electric Company, Schenectady, N. Y.; 61, R. W. Geldart, New York; 65, Harron, Rickard & McCone, San Francisco, Cal.; 70, Handlan-Buck Mfg. Company, St. Louis, Mo.; 77, Hyde Windlass Company, Bath, Me.; 91, Manning, Maxwell & Moore, New York; 96, Morgan Engineering Company, Alliance, Ohio; 99, Niles-Bement-Pond Company, New York; 101, Oliver Machinery Company, Grand Rapids, Mich.; 106, Railway Appliances Company, Chicago, Ill.; 111, Royce & Ricketts, Washington, D. C.; 123, B. F. Sturtevant Company, Hyde Park, Mass.; 130, Sprague Electric Company, New York; 133, Smith, Courtney & Co., Richmond, Va.; 138, Tindel-Morris Company, Philadelphia, Pa.; 141, Vandyck-Churchill Company, New York; 144, H. B. Underwood & Co., Philadelphia, Pa.; 147, Vermilye & Powers, New York; 161, Westinghouse Electric & Mfg. Company, Baltimore, Md.

Schedule No. 257.

Class 51. One screw machine—Bidder 38, $1,050.

Class 52. One metal planing machine—Bidder 91, $3,000; 99, $2,955; 111, $2,855; 141, $2,625.

Class 53. One cold saw cutting-off machine—Bidder 35, $1,300; 106, $740; 141, $880.

Class 54. One engine lathe—Bidder 35, $1,800; 99, $1,793; 111, $1,800; 141, $1,790.

Class 55. One single frame steam hammer—Bidder 2, $920; 46, $742; 61, $1,350; 70, $744; 91, $900; 96, $975; 99, $795; 111, $745; 141, 819; 147, $745.

Class 56. One portable boring bar—Bidder 46, $474; 70, $495; 144, $498.

Class 57. One 38-inch band saw—Bidder 35, $350; 101, $705; 133, $705.

Schedule No. 258.

Class 61. One 40-inch motor driven metal sawing machine—Bidder 12, $3,133 and $2,185; 99, $2,260; 106, $1,859; 111, $2,100; 138, $3,300.

Class 62. Four steam windlasses—Bidder 3, $2,100; 77, $2,100.

Schedule No. 259.

Class 72. For converting a square shaft 40-ton traveling crane into an electric traveling crane of the same capacity—Bidder 2, $6,800; 25, $5,400; 91, $5,190; 96, $6,365; 99, $4,490.

Class 121. Two 200-kw. reversible motor generator sets—Bidder 31, $12,857; 55, $9,619; 161, $9,375.

The following bids were opened December 30 at the office of the commissioners, Washington, D. C., for the construction of a 30,000,000-gallon pumping engine:

Allis-Chalmers Company, Milwaukee, Wis., $74,800; alternate bids, $67,900 and $66,700.

Holly Mfg. Company, Buffalo, N. Y., $81,390.

Camden Iron Works, Camden, N. J., $89,000.

Wm. Todd Company, Youngstown, Ohio, $91,550; alternate bids, $84,000 and $87,800.

Trade Publications.

Small Tools.—Pratt & Whitney Company, Hartford, Conn. Catalogue No. 3. Size, 5 x 7 inches; pages, 200. Covers a very comprehensive line of small tools and standards and gauges, including taps and dies of all kinds ,die stock sets for bolt and pipe threading, milling cutters, slitting saws, Renshaw ratchet drills, lathe tools, tapping heads, boiler punches, reamers, taper pins, thread gauges, outside and inside caliper gauges, and gauges for many special purposes. An introductory section gives tables and formulæ for threads of the United States standard, the International or French standard, sharp V threads, Acme standard, Whitworth standard and British Association standard, and strongly recommends the first. Many useful tables of interest appropriate to the subject of the catalogue are appended.

Shapers.—Gould & Eberhardt, Newark, N. J. Catalogue. Size, 6 x 9 inches; pages, 50. Describes in unusual detail the redesigned line of high duty shapers made by this company in 14, 16, 20, 24 and 34 inch sizes. An illustration and tables of dimensions of each size are given, and numerous other illustrations show special features in the construction of the ram, crank motion, driving pulley, table support and cross rail. A shaper of special design is shown intended for removing sinker heads, gates and risers from steel castings, &c. The latter part of the catalogue deals with attachments and applications of motor drive. Among the former are vises, gear box, index centers, circular and tilting tables, an automatic variable feed for the head, rack cutting and milling attachment, and concave and convex attachments.

Motors and Compressors.—National Electric Company, Milwaukee, Wis. Two bulletins. No. 359 pertains to polyphase induction motors, the various principal parts of which are described and illustrated. These motors are made for 25 and 60 cycle current in sizes of from 1 to 75 horse-power. No. 363 has for its subject stationary and portable motor driven air compressors for continuous and intermittent service.

Power Pumps.—F. E. Myers & Bro., Ashland, Ohio. Catalague and price-list of horizontal and vertical power pumps, working heads, pumping jacks, countershafts, horse-powers, boiler feed pumps, irrigation cylinders, &c. The power pumps shown are self contained and are adapted for gasoline engine, electric motor or belt drive. They are designed to sell at a moderate price and are adapted for use in small factories, apartment houses and summer resorts for fire protection and house supply, and in farming and garden work for watering and irrigating. The engravings represent several different patterns of each class of machine.

Arc Lamps.—American Arc Lamp Company, Kalamazoo, Mich. Catalogue. Size, 6 x 9 inches; pages, 40. Deals with standard and miniature inclosed arc lamps for use in shops, factories, stores, offices, &c. The line presented is one formerly made by the Lea Electric Mfg. Company, Elwood, Ind., but improved with respect to workmanship and efficiency by the company which is successor. Half-tone engravings show several different styles and their parts.

Upright Drills.—W. F. & John Barnes Company, Rockford, Ill. Catalogue No. 64. Size, 6 x 9 inches; pages, 54. An extensive range and variety of upright drills are illustrated, and various special features are made the subject of individual treatment. The sizes shown range from bench friction disk drills of 8-inch swing to upright drills of 50-inch swing. Different manners of equipping are indicated by typical illustrations. Among the special features described are a positive self feed, a back gear arranged inside of the driving cone, a gear tapping attachment and a compound table. Special machines shown in the latter half of the catalogue include a horizontal radial drill, a three-spindle drill, tire drill, emery grinders, gang drills and various applications of motor drive.

Marine Engines.—Marine Iron Works, Station A, Chicago, Ill. Circular. Illustrates some recent work in small and medium sized compound marine engines, and includes a leaflet concerning a small test pump for boiler testing.

Elevators.—Otis Elevator Company, 11 Battery Place, New York City. Catalogue. Size, 8 x 9 inches; pages, 62. Contains illustrations with brief descriptions of each of several types of elevators manufactured by this company. These include electric elevators with double and single worm gear, for passenger or freight service, with electrical or mechanical control, for installing overhead or in the basement; electric elevators with push-button control, single belt electric freight hoist, sidewalk and dock hoist, hydraulic elevators of horizontal and vertical cylinder types, high and low pressure, direct acting plunger elevators, and steam elevators and hoists. Quite a part of the catalogue is given to explaining the machinery and the controlling and safety devices. The latter part shows a number of special forms of elevating apparatus, including escalators and inclined railways. The last three pages give dimension diagrams for passenger and freight elevators, showing the relation of the hatchway, platform and car sizes, with various types of construction.

Alternators.—National Electric Company, Milwaukee, Wis. Bulletin 358. Contains an extended discussion of the construction and operation of a line of belt driven alternating current generators.

November Iron and Steel Exports and Imports.

A further gain in the United States exports of iron and steel is shown by the report of the Bureau of Statistics of the Department of Commerce and Labor for the month of November. The total value of all such exports, except iron ore, was $13,346,029 in November, as compared with $12,672,947 the previous month and $12,803,287 in November, 1904. A heavy gain is shown in those particular commodities for which quantities are given and for which the following table shows the movement for the month and 11 months:

Exports of Iron and Steel.

Commodities.	November. Gross tons. 1905.	November. Gross tons. 1904.	Eleven months. Gross tons. 1905.	Eleven months. Gross tons. 1904.
Pig iron	16,367	2,530	57,179	45,884
Scrap	655	642	7,215	25,424
Bar iron	2,696	2,398	29,287	27,288
Wire rods	959	3,528	5,795	18,045
Steel bars	1,020	1,728	19,094	23,333
Billets, ingots, blooms	23,252	20,547	203,032	296,162
Hoop, band, scroll	468	351	3,822	2,999
Iron rails	....	15	.....	1,402
Steel rails	23,365	53,723	273,306	395,849
Iron sheets and plates	783	356	7,203	4,251
Tin plates and terne plates	569	975	7,498	7,359
Structural iron and steel	10,027	6,262	72,428	49,773
Wire	19,625	14,175	134,338	108,412
Cut nails	293	538	7,495	8,616
Wire nails	2,545	4,711	33,138	28,416
All other, including tacks	293	287	3,771	2,696
Totals	102,917	112,766	864,601	1,045,909

According to the above table the total quantity of such commodities exported in November was 102,917 gross tons. This compares with 89,728 tons in October, 85,969 tons in September, 82,317 tons in August and 67,071 tons in July. The increased movement in November was principally in pig iron, structural shapes and wire. Steel billets and rails showed some falling off.

The imports have suffered a decline, although not heavy. In fact the importation of iron and steel has for some time been fairly uniform. The total value of all iron and steel imports, not including iron ore, was $2,091,998 in November, against $2,255,217 in the previous month and $1,542,883 in November, 1904. Taking the commodities for which quantities are given the following table shows the movement for the month and 11 months:

Imports of Iron and Steel.

Commodities.	November. 1905. Gross tons.	November. 1904. Gross tons.	Eleven months. 1905. Gross tons.	Eleven months. 1904. Gross tons.
Pig iron	14,999	5,391	185,890	73,685
Scrap	3,136	628	15,740	12,429
Bar iron	4,962	1,656	34,148	18,793
Rails	144	....	16,704	37,444
Hoop, band and scroll	340	2	2,807	1,944
Billets, slabs, bars, &c.	1,688	698	13,189	10,277
Sheets and plates	233	232	2,115	4,008
Tin plates and terne plates	3,655	3,878	62,433	64,946
Wire rods	1,596	1,000	16,054	14,062
Wire and articles made from	476	275	3,559	3,646
Structural iron and steel	2,649	88	12,553	6,983
Chains	10	37	221	346
Anvils	16	15	185	138
Totals	33,904	13,899	365,598	248,701

It will be observed from this table that the total of such commodities for November was 33,904 gross tons, which compares with 35,801 tons in October, 43,264 tons in September, 39,504 tons in August and 36,444 tons in July.

Importations of iron ore for the 11 months ending with November were 771,001 gross tons, against 421,264 tons the corresponding period of the previous year.

The value of all exports of iron and steel for the 11 months ending with November, not including iron ore, was $128,942,253, against $118,154,305 in the corresponding period of the previous year. The total values of similar imports for the same periods were respectively $23,912,947 and $19,946,081.

HARDWARE

THE most marked impression made by a cursory view of the past half century, as given in our last issue, is of the progress which has been made in manufacturing methods and in the manner, variety and volume of manufactured products. The change has been simply astounding and difficult even for those who have followed the process from year to year at all adequately to realize. Distributing methods also show progress, but not, it would appear, in like degree. In manufacturing the instinct is to reduce expenses to a minimum, and the result is that goods of simple construction by the use of machinery, often automatic, are produced at incredibly low cost. The method of marketing the manufacturers' products is, however, recognized to be theoretically and practically unsatisfactory as involving too much expense. The sales department of the manufacturer requires maintenance of a formidable office force and a corps of travelers in the field. By this means a good proportion of his goods is placed in the hands of jobbing houses who are obliged to maintain great establishments and to find customers among the small merchants of the country who are visited at serious and increasing expense by an army of salesmen who are treading upon one another's heels—playing hide and seek, as it were—in the restless chase for business. Even when the goods find their place in the retail merchant's store the items that enter into the bill of costs of their distribution are not complete, for it is the experience of the retail merchant that it actually costs him from 10 to 20 per cent. to do business. The art of distribution has not kept pace with the art of fabricating goods. Here is one of the problems which awaits solution.

This is the month when more perhaps than any other attention will be given to arrangements for the approaching retail Hardware conventions on the part of the officers and those especially charged with the duty of preparing the programmes. So far as the welfare of the associations is concerned it is difficult to overestimate the importance of this work. Many a convention has been far less successful and useful than it might have been simply because of the lack of judicious arrangement for its sessions. The spirit of fraternity will do something in getting the members together, but it must be recognized that when they come together in their annual gatherings they have a right to expect a programme which, with the active co-operation of the membership, will secure a profitable meeting, stimulating in its tone and suggestive as to business plans and methods. The result should be that the merchant goes back to his store with a new sense of the dignity of his calling, more keenly alive to the opportunities which are awaiting him, and enriched with not a few practical suggestions which he can advantageously put into effect.

Unless there is such interest in the conventions and such practical benefit it is not to be expected that the members will continue to attend them. With all their fraternal and social spirit, which is not to be undervalued, with all their importance as giving voice to the trade on questions affecting the welfare of retail merchants, the conventions are to be regarded as a means of educating the merchants and furnishing opportunity for the interchange of views and the narration of experiences in matters of mutual interest. They should be instructive and stimulating and calculated to make those attending them better merchants. The increasing attendance at these annual gatherings indicates how well they accomplish their mission and the interest with which they are regarded, and presumably the benefit which the membership derive from them. The effort, however, must be to attain to still better things and some of the associations may profit by mistakes in the past and be able to arrange more attractive—that is, more useful programmes than ever before. We bespeak on the part of the members a readiness loyally to co-operate with the plans which the officials are making for the conventions and to attend them prepared to give information and suggestions which will be helpful to their fellow members. Only in this spirit can the meetings be made notably successful.

Condition of Trade.

Trade after the recreation and the pleasure of the holidays and the special attention, involving not a little labor, which has to be given to business matters, is beginning to resume its normal course. With jobbers and manufacturers it has been a busy time, closing up the accounts of the year, conferring with traveling salesmen, deciding upon the broad lines of policy to be pursued and maturing detailed plans for the carrying on of the campaign which will so soon open. Quite similar questions, though in different form, present themselves to retail merchants, who also at this time find it advisable to take their bearings anew and prepare for the trade of the coming season. With these occupations on the part of the merchants, large and small, and the general absence from the road of traveling salesmen, whose efforts bring in so large a proportion of the orders, there has not been any special activity in buying except in lines where the conditions of the market made it obviously prudent to purchase without delay. The strength of the market, however, has been such as to make those who were in close touch with existing conditions and in a position to judge of the tendencies toward higher prices recognize the desirability of their getting in their orders before further advances took place. There is, however, a fair volume of current business, for the trade of the country is active and goods in great quantities are constantly going into consumption. Advances in Hardware and related lines are frequent, while at the same time a few kinds of goods are weak and irregular owing to the breaking up of combinations, as in Axes, or to excessive competition between manufacturers, as in Screen Wire Cloth. The general tone of the market, however, is decidedly strong and the indications point to a large and satisfactory business.

Chicago.

Following the holiday season and the inventory period the Western Hardware trade has opened auspiciously and there is already a resumption of demand for staple lines, which dropped off late in November. Nearly all of the large jobbers report last year's business the biggest in their history and profits generally were extremely satisfactory. Reports thus far this year indicate a continuation of last year's prosperity. Filling in orders are now being received for Skates, although sales of Sleds, Snow Shovels and other cold weather goods have been curtailed on account of the light fall of snow throughout the West and Northwest thus far this winter. The sale

of Horseshoers' Outfits and other Heavy Hardware has been of large volume, notwithstanding the light fall of snow. The advance announced in Builders' Hardware, and which became effective on January 1, was unexpected by jobbers and consumers and rather was expected during the fall months than at this season of the year. Of course it was natural that higher prices should prevail on solid bronzes on account of the rapid advances in copper, and as the advance only averages 10 per cent. it is generally considered very conservative. An advance of $1 a ton went into effect on Monday on all classes of Wire products, including Nails, Barb and Smooth Wire, Staples, &c. This advance was generally expected by the trade one week ago, and throughout the month of December large jobbers placed heavy contracts with the mills to cover their future requirements in anticipation of these higher prices.

NOTES ON PRICES.

Wire Nails.—On January 8, as intimated in our issue of January 4, the American Steel & Wire Company advanced the price of Wire and Wire products $1 per ton, the advance becoming effective at the close of business that day. While there has been a feeling among the trade for a month or more that an advance would take place near the first of the year, the delay in its announcement had rather shaken their confidence that the change in price would take place at this time, so that the announcement was after all something of a surprise to many. Large buyers have to some extent discounted the advance by placing liberal contracts with the mills. If the reports are well founded that stocks in jobbers' and merchants' hands are universally low, this will no doubt tend to prevent cutting by the jobbers. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.85
Carload lots to retail merchants	1.90

New York.—An advance of 5 cents per keg has taken place in the price of Wire Nails. Local demand is moderate, incident to the season. Quotations on small lots from store are on the basis of $2.10 per keg.

Chicago.—On Monday, January 8, prices were advanced $1 a ton, this action having been taken concurrently by the American Steel & Wire Company and the independent manufacturers. This places quotations $2 a ton above those prevailing at this time last year and just previous to the advance which went into effect in February, amounting to $1 a ton. Everything considered, quotations are on an exceedingly conservative basis. That the advance would be made was pretty generally understood by jobbers and large consumers, who placed heavy contracts for the 60-day requirements during the month of December. We revise quotations as follows: $2 in car lots to jobbers and $2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mill.

Pittsburgh.—Effective on Monday, January 8, the American Steel & Wire Company and leading independent mills announced an advance of 5 cents in prices of Wire Nails, or from $1.80 to $1.85 per keg. This advance is the natural result of an extraordinary demand for this season of the year and also the high prices and scarcity of Steel. Some of the Wire Nail mills are having great difficulty in getting Steel and Rods promptly and the situation in this respect does not promise to be relieved for some little time. Jobbers have been placing large orders recently in expectation of an advance in prices and the mills have a very large amount of business on their books. We are advised that the market is very firm and the outlook for spring trade could hardly be more promising. We quote Wire Nails at $1.85 in carloads to the largest jobbing trade and $1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

Cut Nails.—No advance in Cut Nails has taken place as the result of the higher price in Wire Nails. The next meeting of the Cut Nail Association will be held on January 31. The demand has been exceptionally heavy at the mills for the season. Quotations are as follows: $1.75, base, for carload lots, f.o.b. Pittsburgh; $1.80 for less than carloads, f.o.b. Pittsburgh; $1.90 for carload lots, on dock, New York; $1.95 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

New York.—At the present time demand is restricted to actual necessities. Quotations for small lots from store are on the basis of $1.95 to $2 per keg.

Chicago.—In view of the advance of $1 a ton on Wire Nails it is probable that both Iron and Steel Cut Nails will be quoted at higher prices in the near future. Sales continue unusually heavy and the increased consumption may to some extent be due to the scarcity of Wire Nails, although several jobbers in this city have reported greatly increased sales during 1905, indicating a growing use of the old Cut Nail in spite of the fact that the tendency generally in the past few years has been in an opposite direction. Prices are firmly maintained, as follows: Steel Cut Nails, in car lots, $1.90 to $1.95; less than car lots, $2; Iron Cut Nails, $2 to $2.05.

Pittsburgh.—We are advised that the recent advance of 5 cents per keg in price of Cut Nails is being firmly held, and in view of the advance of 5 cents per keg in Wire Nails it is not unlikely that the Cut Nail Association will announce a further advance in Cut Nails before long. Quotations are as follows: $1.75, base, for carload lots, f.o.b. Pittsburgh; $1.80 for less than carloads, f.o.b. Pittsburgh; $1.90 for carload lots, on dock, New York; $1.95 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

Barb Wire.—An advance of $1 per ton has been made in Barb Wire, taking effect at the close of business January 8. Low stocks in jobbers' hands and the possibility of an advance has stimulated demand to an unusual extent for the season. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.00	$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots	2.15	2.45

Chicago.—An advance of $1 a ton on Painted and Galvanized Barbed Wire and staples went into effect on Monday, January 8. It was by no means unexpected and was looked for by the consuming trade several weeks ago. While many large jobbing interests succeeded in closing for a portion of their spring requirements late in December, a large amount of business still remains to be placed. We revise quotations as follows: To jobbers, Chicago, car lots, Painted $2.15; Galvanized, $2.45. To retailers, car lots, Painted, $2.20; Galvanized, $2.50. Retailers, less than car lots, Painted, $2.30; Galvanized, $2.60. Staples, Bright, in car lots, to jobbers, $2.10; Galvanized, $2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Effective January 8, American Steel & Wire Company and the independent mills announced an advance of $1 per ton in prices. This action was generally anticipated by the trade, which has been placing good sized orders for some time. We are advised that the outlook for a large spring business is very good, and the general condition of the Wire trade could hardly be better. We quote Painted Barb Wire at $2 and Galvanized at $2.30 in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Smooth Fence Wire.—The advance, made at the close of last week, of $1 per ton in Wire products also affects Smooth Fence Wire. New business and specifications on contract orders are keeping the mills exceedingly busy. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9.

The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—The advance of $1 a ton on Wire products affects Smooth Fence Wire as well, but inasmuch as practically all of the tonnage that is now moving was contracted for early in the fall months the advance on this product will not materially affect consumers. Specifications on existing contracts continue greatly in excess of mill shipments. We revise quotations as follows: To jobbers, $1.85 f.o.b. Chicago in car lots, and car lots to retailers, $1.90.

Pittsburgh.—American Steel & Wire Company and the independent interests have advanced prices $1 a ton, effective from January 8. This has been expected for some time and as a result the trade has been placing very liberal orders and the mills have a large tonnage on their books. The market is very strong and it is intimated that a further advance may be made before this month is out. All indications point to a very heavy spring trade and the mills are still having trouble in getting a full supply of Steel, which interferes with operations to some extent. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

Silver Ware.—An advance in Sterling Silver Goods and Silver Plated Ware was put into effect the first of the year by concerted action on the part of a majority of the manufacturers. This is of special interest to Hardwaremen because it includes Flat Ware, a line pretty generally handled by the trade. Prices on cheaper grades of Flat Ware are approximately 10 per cent. higher, although the highest grades remain the same. On Hollow Ware a general advance of 10 per cent. has been declared. Referring to these changes representatives of important manufacturing interests assert that they are but a tardy recognition of increased costs arising from higher labor and the steady advances during the past year in all requisite raw materials, including Tin, Copper, Spelter and Nickel, as well as Silver.

Cast Iron Hardware.—Higher prices are very generally ruling on Cast Iron Hardware, including such goods as Grindstone Fixtures, Well Wheels, Pulleys, Gate Hinges and Latches, Blind Hinges, &c. As an indication of the course of the market it may be instanced that two important manufacturers have announced advances since the first of the year of 5 and 7½ per cent. respectively. These changes may be attributed to a natural sympathy with other markets and especially to the heavy increase in the cost of raw material.

Table Cutlery.—The trade is watching with interest the market for Gross Goods and Scale Tang Cutlery. It will be remembered that association control of prices on these lines has lately been discontinued, a fact leading to the belief that lower prices might be expected. Efforts are being made, however, to bring the manufacturers into some sort of agreement, the outcome of which is still in doubt. It is understood that some large buyers have already received quotations from a prominent manufacturer representing a decline of about 10 per cent. on former prices. Other producers confidently assert that they can place their entire capacity at or near old prices and declare that trade conditions are such as to preclude much irregularity in the market.

Axes.—The Axe market may be described as a waiting one, although there is an undertone of weakness, and large buyers are reported to have received quotations considerably below the prices recently ruling. This fact has created an unpleasant impression as to the candor of the broadcast announcements that old prices must be maintained until March 1 under the rules of the association. There are some, indeed, who assert that prices have not been maintained within the association for many months and who attribute to this cause more than any other the dissolution of the pool. There certainly appears to be some ground for this assertion. As a matter of fact, however, a vigorous effort is now being made by the most influential interests to keep up appearances and prevent open price cutting, this effort being avowedly in the interest of the jobbing trade. In this connection it may also be noted that under the rules of the association prices were guaranteed 60 days from the opening of the quarter, so that an open cut might lead to claims for rebates which it would be difficult to refuse. The trade has received a number of circular letters, more or less uniform in tone, referring to the situation in a general way and stating what may be expected from the senders in the way of protection, &c. Smaller manufacturers, in response to inquiries from their customers, declare frankly that they do not know exactly where they are and propose to defer announcing their position until the situation has cleared. Referring to the possibility of lower prices in the near future it may be said that while some of the trade are disposed to look for very low figures approximating, perhaps, the level reached about three years ago, those who are best informed from the productive point of view declare that a return to such prices is virtually precluded by the heavy increase in the cost of labor and the large advances shown by comparing the present costs of raw materials, such as Steel, Borax and Handles, with those prevailing at the former period. Moreover all indications point to a year of unexampled prosperity accompanied by a large volume of business and stocks in the hands of the jobbing trade are known to be exceptionally low.

Sheet Zinc.—Under date of January 6 another advance is to be noted in Sheet Zinc, which is now quoted at $8 per 100 pounds, f.o.b. mill, in 600-pound casks, subject to the following discounts for cash and quantity:

	Cash with order. Per cent.	Quantity. Per cent.	Total. Per cent.
Carload lots	3	5	8
9,000-pound lots	3	3	6
6,000-pound lots	3	2	5
3,000-pound lots	3	1	4
Less than 3,000 pounds	3	0	3

Wrought Pipe.—A slight change in the classification of Wrought Pipe has been made by the manufacturers and present discounts to consumers in carloads for Steel Pipe are as follows:

Wrought Pipe.	Black. Per cent.	Galvanized. Per cent.
⅛ and ¼ inch	71	55
⅜ inch	73	59
½ inch	75	63
¾ to 6 inches	79	69
7 to 12 inches	74	59
Plugged and reamed:		
1 to 4 inches	77	67
Extra strong, plain ends:		
⅛ to ⅜ inch	64	52
½ to 4 inches	71	59
4½ to 8 inches	67	55
Double extra strong, plain ends:		
½ to 8 inches	60	49

Registers.—The prices on Registers adopted by the manufacturers and very generally maintained during the latter half of 1905 are reaffirmed for the first quarter of 1906. This is sufficient indication of the continued large volume of business and of present satisfactory market conditions, as a slight reduction at this time was more than half expected in some quarters. The mildness of the winter has undoubtedly facilitated building operations and has thus been influential in the continuance of a steady demand for goods. It is understood that special concessions are being offered to jobbers on early orders for quantity lots, contingent on the maintenance of association prices.

Bright Wire Goods.—The advance in Bright Wire Goods declared early in December was well maintained and a further advance has just been announced, bringing the price up to 90 and 25 per cent. discount to good retail trade, although additional concessions may be secured by jobbers and on desirable orders. Brass Cup Hooks and Brass Screw Hooks not included under the classification of Bright Wire Goods have also advanced and are now quoted at 85 and 10 per cent. discount to average trade.

Spring Cotters and Keys.—A revised list of Spring Cotters and Flat Spring Keys has been adopted by the various manufacturers. It is subject to discounts ranging from 90 and 50 per cent. to 90 and 50 and 10 and 5 per cent., according to the grading of the purchaser and the size of the order. From the new list which is given below it will be observed that the larger sizes are materially advanced.

Spring Cotters.

Price per 1000.

Wire gauge	13	12	11	10	9	8	7	6	5	4	1				
Diameter	3-32	7-64	1-8	9-64	5-32	11-64	3-16	13-64	7-32	1-4	5-16	3-8	7-16	1-2	5-8
Length.															
1-2	$3.50	4.00	5.00	6.00	7.00	8.00	....	....	....	....	....	....	....	....	....
3-4	4.15	4.75	5.85	7.00	8.15	9.30	11.10	12.00	....	....	....	....	....	....	....
1	4.80	5.50	6.70	8.00	9.30	10.60	12.80	14.00	18.00	20.00	32.50	....	....	....	....
1¼	5.45	6.25	7.55	9.00	10.45	11.90	14.50	16.00	20.80	23.50	37.50	....	....	....	....
1½	6.10	7.00	8.40	10.00	11.60	13.20	16.20	18.00	23.60	27.00	42.50	72.00	....	....	....
1¾	6.75	7.75	9.25	11.00	12.75	14.50	17.90	20.00	26.40	30.50	47.50	79.20	108.00	....	....
2	7.40	8.50	10.10	12.00	13.90	15.80	19.60	22.00	29.20	34.00	52.50	86.40	119.50	148.50	....
2¼	...	...	10.95	13.00	15.05	17.10	21.30	24.00	32.00	37.50	57.50	93.60	131.00	163.50	....
2½	...	...	11.80	14.00	16.20	18.40	23.00	26.00	34.80	41.00	62.50	100.80	142.50	178.50	....
2¾	...	...	....	....	....	....	24.70	28.00	37.60	44.50	67.50	108.00	154.00	193.50	....
3	...	...	....	....	....	....	26.40	30.00	40.40	48.00	72.50	115.20	165.50	208.50	384.00
3¼	...	...	....	....	....	....	....	....	....	51.50	77.50	122.40	177.00	223.50	404.00
3½	...	...	....	....	....	....	....	....	....	55.00	82.50	129.60	188.50	238.50	424.00
3¾	...	...	....	....	....	....	....	....	....	58.50	87.50	136.80	200.00	253.50	444.00
4	...	...	....	....	....	....	....	....	....	62.00	92.50	144.00	211.50	268.50	464.00
5	...	...	....	....	....	....	....	....	....	....	....	....	257.50	328.50	544.00
6	...	...	....	....	....	....	....	....	....	....	....	....	....	388.50	644.00

Flat Spring Keys.

Price per 1000.

Length	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½
Width.										
3-8	$39.00	44.50	50.00	55.50	61.00	66.50	72.00	77.50	....	....
1-2	52.00	58.00	64.00	70.00	76.00	82.00	88.00	94.00	....	....
5-8	....	....	78.00	84.50	91.00	97.50	104.00	110.50	117.00	123.50
3-4	....	....	....	104.00	111.00	118.00	125.00	132.00	139.00	146.00
7-8	....	....	....	....	....	....	....	....	....	....

Cellar Box Cotters.

Price per 100.

Diameter	3-8	7-16	1-2	9-16	5-8	3-4
Length.						
3	....	.....	.....	.....	.....	$900.00
4	....	.....	.....	.....	.....	1,068.00
5	....	.....	.....	.....	.....	1,236.00
6	....	.....	.....	.....	.....	1,404.00
7	$412.00	$628.00	$796.00	$852.00	$960.00	1,572.00
8	454.00	689.00	877.00	948.00	1,080.00	1,740.00
9	496.00	750.00	958.00	1,044.00	1,200.00	1,908.00
10	538.00	811.00	1,039.00	1,140.00	1,320.00	2,076.00
11	580.00	872.00	1,120.00	1,236.00	1,440.00	2,244.00
12	622.00	933.00	1,201.00	1,332.00	1,560.00	2,412.00
13	664.00	994.00	1,282.00	1,428.00	1,680.00	2,580.00
14	706.00	1,055.00	1,363.00	1,524.00	1,800.00	2,748.00
15	748.00	1,116.00	1,444.00	1,620.00	1,920.00	2,916.00
16	790.00	1,177.00	1,525.00	1,716.00	2,040.00	3,084.00
17	832.00	1,238.00	1,606.00	1,812.00	2,160.00	3,252.00
18	876.00	1,299.00	1,687.00	1,908.00	2,280.00	3,420.00

Sheet Metal Ware.—The market for Stamped, Pieced and Galvanized Ware, &c., is characterized by a strengthening tone, advances approximating 5 per cent. having been made on certain lines by several manufacturers. Comparisons are rendered difficult by the variant methods of quotations now in force, and the changes made by some concerns are not always readily apparent because of the manipulation of lists and discounts. It is doubtful if there is any considerable improvement in market conditions, but the opinion is expressed that prices on lines marked by keenest competition can hardly go much lower, as the resources of some producers are being severely tested to meet them on the present level.

Roofing and Building Papers.—The market for Tarred Roofing Felts, Building Paper and kindred materials is in much the same condition as it has been, except that such changes as are made are in the way of advances, this being particularly so of Deadening Felt, which is sympathetic with the price of Rag Stock, while in Slaters' Felt there seems to be but little made, the present price of which, however, is $35.50 per ton, Deadening Felt ruling at $50 per ton, but this is always higher at this season of the year. Single-ply Tarred Roofing, to large trade in carload lots, is $30 per ton, two-ply 50 cents and three-ply 70 cents, in 40-pound rolls. The same goods less than car lots are respectively $32.50, 55 and 75 cents. Rosin sized Sheathing is $30 per ton.

Paris Green.—Manufacturers of Paris Green have not announced prices for the coming season, and do not expect to do so for some time. There is comparatively little Arsenic in this country, while orders placed in foreign countries have been held back for three months. It is consequently scarce and high, and until the market settles, which may not be before the last of next month, no prices are being made on Paris Green. Manufacturers of Paris Green, who made up some last fall, are accepting orders and shipping the goods subject to the opening prices.

Window Glass.—A meeting of the Window Glass manufacturers is to be held to-day (Wednesday). It is inferred from reports in circulation in Glass circles that there will be no reduction in wages, as some manufacturers, including co-operative concerns, have been stocking their Glass, awaiting higher prices. According to a paper devoted to Glass interests there is a 2500-pot capacity in actual operation, producing probably 750,000 boxes of Glass per month, plus the American Company's production, estimated at 250,000, making the total production, approximately, 900,000 to 1,000,000 boxes per month, which, it is said, is being well taken. In the local market demand is light and quotations are as follows: First three brackets, single, 90 and 10 to 90 and 20 per cent. discount; all other sizes, 90 and 5 to 90 and 10 per cent. discount.

Rope.—Manufacturers have a fair amount of business on their books with which to begin the new year. The market is fairly well maintained and quotations are as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9½ cents; No. 2 quality Sisal, 8 cents per pound.

Paints and Colors.—*Leads.*—An advance of ¼ cent per pound has been made in the price of Dry White Lead and Lead in Oil, resulting in the following quotations: In lots of 500 pounds or over, 7¼ cents; in lots of less than 500 pounds, 7¾ cents per pound. In view of possibility of future prices of Pig Lead corroders are pursuing a conservative policy in accepting orders for large lots of Dry White Lead and Lead in Oil for future delivery. The consumption for 1905 exceeded that of the previous year and from present indications the demand for the coming season will be large.

Linseed Oil.—Flaxseed has advanced about 6 cents per bushel, which caused reports of a higher Oil market. The local market reflects the usual winter dullness. Quotations are as follows: Out of town Raw, 40 to 42 cents; City Raw, 42 to 43 cents per gallon. Boiled Oil, 1 to 2 cents advance over Raw.

Spirits Turpentine.—The market at this point is a little lower, reflecting a falling off in price at Southern markets. The local demand is moderate on an uncertain future. New York quotations are as follows, according to quantity: Oil Barrels, 66½ to 67; machine made Barrels, 67 to 67½ cents per gallon.

BULLARD WRENCH CATALOGUE.

BULLARD AUTOMATIC WRENCH COMPANY, Providence, R. I., has recently issued an attractive illustrated catalogue in which the construction and advantages of the Bullard Wrench are clearly set forth. It is referred to as not merely a new Wrench, but a distinctly novel Wrench, operating on a novel principle.

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Sixth Annual Meeting at Dallas, January 23, 24 and 25. President, S. L. Erwin, Honey Grove; secretary, J. W. McManus, Waxahachie.

NORTH DAKOTA RETAIL HARDWARE ASSOCIATION:

Ninth Annual Meeting at Grand Forks, January 30 and 31. President, H. F. Emery, Fargo; secretary, C. N. Barnes, Grand Forks.

COLORADO RETAIL HARDWARE ASSOCIATION:

Fourth Annual Meeting at Denver, February 7 and 8. Headquarters Adams Hotel. President, A. B. Meservey, Colorado Springs; secretary, Davis Barkley, Fort Collins.

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CONNECTICUT RETAIL HARDWARE ASSOCIATION:

Third annual meeting at New Haven, February 27 and 28. President, Chas. G. Agard, Torrington; secretary, James De F. Phelps, Windsor Locks.

OHIO HARDWARE ASSOCIATION:

Twelfth annual meeting at Canton, February 27 and 28 and March 1. Headquarters and Exhibits at Auditorium Building. President, John F. Baker, Dayton; secretary, Frank A. Bare, Mansfield.

MINNESOTA RETAIL HARDWARE ASSOCIATION:

Tenth annual meeting at Minneapolis, February 28, March 1 and 2. Headquarters at Nicollet House. President, A. T. Stebbins, Rochester; secretary, M. S. Mathews, Boston Block, Minneapolis.

NEW ENGLAND RETAIL HARDWARE ASSOCIATION:

Thirteenth annual meeting at Boston, March 1 and 2. President, J. B. Hunter, Boston; secretary, F. Alexander Chandler, 36 Federal street, Boston.

CALIFORNIA STATE RETAIL HARDWARE ASSOCIATION:

Fifth annual meeting in March at San Francisco. President, H. C. Bennett, San Francisco; secretary, Henry Gracey, 235 Powell street, San Francisco.

NATIONAL RETAIL HARDWARE ASSOCIATION:

Annual meeting at Chicago in March. President, W. P. Bogardus, Mt. Vernon, Ohio; secretary, M. L. Corey, Argos, Ind.

Minnesota Retail Hardware Association.

The tenth annual convention of the Minnesota Retail Hardware Association will be held at the Hotel Nicollet, Minneapolis, February 28, March 1 and 2. The annual meeting of the Retail Hardware Mutual Fire Insurance Company will be held on March 1 at the same place.

Ohio Hardware Association.

The annual meeting of the Ohio Hardware Association at Canton on February 27 and 28 and March 1 gives every promise of eclipsing all former gatherings of the association. It looks as if the attendance of retail merchants would be larger than ever before, while, judging from the applications from manufacturers for space for exhibits, the number of exhibitors will also exceed any former meeting. A feature of the programme on February 28 will be a lecture on "Hardware Salesmanship," by W. C. Holman, editor of *Salesmanship*. This lecture will be especially for retail Hardware merchants and will be full of practical pointers.

Iowa Retail Hardware Dealers' Association.

The eighth annual convention of the Iowa Association at Des Moines February 14, 15 and 16 promises in many ways to be of State wide interest. General discussions will be made a prominent feature of the meeting. This part of the programme is in charge of a special committee, comprising W. M. Orcutt, Sioux City, chairman; F. R. Currie, Mason City; F. P. Bollinger, Afton; E. B. Woodruff, Knoxville. Among the special features of the programme will be addresses by President Bogardus of the National Retail Hardware Association and President Wright of the National Hardware Association. Mr. Miles, member of the Joint Catalogue House Committee, will give an illustrated presentation of important facts and figures, using a stereopticon to bring out the striking features of his address. Conway MacMillan, an advertising expert, will give an illustrated lecture on "The Advertisement."

Another feature of the programme will be the "school of practical salesmanship," conducted by some of the best known Hardwaremen of the State. Samples of the various articles discussed will be placed upon the platform, thus making the presentation as realistic as possible. Manufacturers, jobbers, traveling salesmen, as well as retail Hardware merchants, will be invited to take part in the discussions. The following topics and speakers are announced: "Stoves," C. F. Schmidt, Marshalltown; "Furnaces," J. F. Doty, West Liberty; "Hay Tools," C. E. Haas, Le Mars; "Paints," S. R. Miles, Mason City; "Builders' Hardware," H. S. Vincent, Fort Dodge; "Field Fence," L. C. Abbott, Marshalltown.

Another new departure for the association will be the exhibits, which will be under the direct auspices of the association officers. The meetings will be held in the Bush Block, and the entire first floor will be devoted to exhibits of Hardware, also the south half of the second floor. This will enable exhibitors to meet all the delegates and merchants visiting the convention. It will bring the exhibits under direct control of the associa-

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Fourth annual meeting at Binghamton, February 20, 21 and 22. President, C. P. Sherwood, White Plains; secretary, J. B. Foley, Syracuse.

CONNECTICUT RETAIL HARDWARE ASSOCIATION:

Third annual meeting at New Haven, February 27 and 28. President, Chas. G. Agard, Torrington; secretary, James De F. Phelps, Windsor Locks.

OHIO HARDWARE ASSOCIATION:

Twelfth annual meeting at Canton, February 27 and 28 and March 1. Headquarters and Exhibits at Auditorium Building. President, John F. Baker, Dayton; secretary, Frank A. Bare, Mansfield.

MINNESOTA RETAIL HARDWARE ASSOCIATION:

Tenth annual meeting at Minneapolis, February 28, March 1 and 2. Headquarters at Nicollet House. President, A. T. Stebbins, Rochester; secretary, M. S. Mathews, Boston Block, Minneapolis.

NEW ENGLAND RETAIL HARDWARE ASSOCIATION:

Thirteenth annual meeting at Boston, March 1 and 2. President, J. B. Hunter, Boston; secretary, F. Alexander Chandler, 36 Federal street, Boston.

CALIFORNIA STATE RETAIL HARDWARE ASSOCIATION:

Fifth annual meeting in March at San Francisco. President, H. C. Bennett, San Francisco; secretary, Henry Gracey, 235 Powell street, San Francisco.

NATIONAL RETAIL HARDWARE ASSOCIATION:

Annual meeting at Chicago in March. President, W. P. Bogardus, Mt. Vernon, Ohio; secretary, M. L. Corey, Argos, Ind.

Minnesota Retail Hardware Association.

The tenth annual convention of the Minnesota Retail Hardware Association will be held at the Hotel Nicollet, Minneapolis, February 28, March 1 and 2. The annual meeting of the Retail Hardware Mutual Fire Insurance Company will be held on March 1 at the same place.

Ohio Hardware Association.

The annual meeting of the Ohio Hardware Association at Canton on February 27 and 28 and March 1 gives every promise of eclipsing all former gatherings of the association. It looks as if the attendance of retail merchants would be larger than ever before, while, judging from the applications from manufacturers for space for exhibits, the number of exhibitors will also exceed any former meeting. A feature of the programme on February 28 will be a lecture on "Hardware Salesmanship," by W. C. Holman, editor of *Salesmanship*. This lecture will be especially for retail Hardware merchants and will be full of practical pointers.

Iowa Retail Hardware Dealers' Association.

The eighth annual convention of the Iowa Association at Des Moines February 14, 15 and 16 promises in many ways to be of State wide interest. General discussions will be made a prominent feature of the meeting. This part of the programme is in charge of a special committee, comprising W. M. Orcutt, Sioux City, chairman; F. R. Currie, Mason City; F. P. Bollinger, Afton; E. B. Woodruff, Knoxville. Among the special features of the programme will be addresses by President Bogardus of the National Retail Hardware Association and President Wright of the National Hardware Association. Mr. Miles, member of the Joint Catalogue House Committee, will give an illustrated presentation of important facts and figures, using a stereopticon to bring out the striking features of his address. Conway MacMillan, an advertising expert, will give an illustrated lecture on "The Advertisement."

Another feature of the programme will be the "school of practical salesmanship," conducted by some of the best known Hardwaremen of the State. Samples of the various articles discussed will be placed upon the platform, thus making the presentation as realistic as possible. Manufacturers, jobbers, traveling salesmen, as well as retail Hardware merchants, will be invited to take part in the discussions. The following topics and speakers are announced: "Stoves," C. F. Schmidt, Marshalltown; "Furnaces," J. F. Doty, West Liberty; "Hay Tools," C. E. Haas, Le Mars; "Paints," S. R. Miles, Mason City; "Builders' Hardware," H. S. Vincent, Fort Dodge; "Field Fence," L. C. Abbott, Marshalltown.

Another new departure for the association will be the exhibits, which will be under the direct auspices of the association officers. The meetings will be held in the Bush Block, and the entire first floor will be devoted to exhibits of Hardware, also the south half of the second floor. This will enable exhibitors to meet all the delegates and merchants visiting the convention. It will bring the exhibits under direct control of the associa-

tion, so that the attendance at the sessions will not be interfered with. The expense to exhibitors will be much less than the former hotel exhibits, and this feature promises to be very popular, as nearly all the space on the first floor has been reserved and a large part of the second floor has been taken. The Iowa Association is now said to number about 600 members, and a large addition of new names is promised at the annual meeting.

The annual meeting of the Iowa Hardware Mutual Insurance Association takes place on January 12 at Mason City, Iowa. Following this annual meeting of this association will be the annual meeting of the Board of Directors. At this meeting the new dividend, or rebate, for 1906 expirations will be declared. Indications are that the present rebate of 25 per cent. will be increased. Since its organization the association has written nearly one and one-half millions of insurance and has returned to policy holders upward of $5000 in cash rebates. The February rebates just sent out amounted to more than $400. A full report of the insurance department will be made at the Hardware association meeting by Vice-President L. Lindenberg of Dubuque.

ENTERPRISE MFG. COMPANY'S CATALOGUE OF FISHING TACKLE.

THE ENTERPRISE MFG. COMPANY, Akron, Ohio, manufacturer of Fishing Tackle, has issued a new catalogue, No. F-24, for the season of 1905-6. The book is a large one, containing about 175 pages, profusely illustrated. A very extensive line is listed, comprising everything necessary for the outfit of the modern angler. Among the supplies included may be noted Fish Hooks of all styles and sizes, furnished Lines, Floats, Sinkers, Ringed Hooks, Reels, Hooks to Gut and Gimp, Line Spreaders, Minnow Gangs, Trolling Spoons, American Spinners, Hard and Soft Rubber and Phantom Minnows, Frogs, Crawfish, Grasshoppers, Dobsons, Insects and many varieties and patterns of Bass, Salmon and Trout Flies. The catalogue also contains an index to stock numbers and stock names.

VON LENGERKE & DETMOLD'S NEW STORE

VON LENGERKE & DETMOLD, 318 Broadway, New York, have nearly completed the removal of their stock to a new location at 349 Fifth avenue, opposite the Waldorf-Astoria Hotel. The building itself is new and especially fine, being partially occupied by fine jewelry trade. The street floor of No. 349 has been handsomely fitted up with mahogany and glass showcases, electrically lighted, and mahogany cabinet work to match, for carrying stock in drawers, closets, &c. On the floor beneath a portion of it in front will be fitted up with a putting green, with holes, and a net from floor to ceiling to drive against by golfers who may wish to try new clubs or be properly instructed in details by expert attendants. On the premises there will also be employed three expert operatives making Golf Clubs for such customers as have ideas of their own which they want worked out in the clubs. Full lines of Sportsmen's Supplies are carried, including Guns, Fishing Tackle, Athletic Goods, Automobile Sundries, Fine Leather Goods for both sexes, Cameras and Photographers' Supplies, Boats, &c., for both wholesale and retail trade.

LIVERIGHT BROTHERS.

ARTHUR K. AND BENJAMIN K. LIVERIGHT of the firm of Mayer & Co., Philadelphia, Pa., manufacturers of Gold Medal Files and Rasps, have purchased the interest of the late Harry Mayer in that concern and will continue the manufacture of this line of Files and Rasps at the same location, Twentieth and Allegheny avenues, under the firm name of Liveright Brothers. They have recently established a Canadian agency with Beaudoin & Laplame, 447 St. Paul street, Montreal, and another on the Pacific Coast, with George F. Eberhard Company, 12 and 14 Drumm street, San Francisco, in order to expedite the transaction of business in those territories. The new firm contemplates a number of improvements to the plant in the near future, so as to increase the productive capacity of the works.

DEATH OF JOHN L. CHAPMAN.

JOHN L. CHAPMAN died Monday, January 8, at his home in Trenton, N. J. He was taken seriously ill about a year ago, but after a partial recovery made one or more business trips for his company. Mr. Chapman was born in Philadelphia nearly 54 years ago, and at the age of 13 entered the employ of Lloyd, Supplee & Walton, Philadelphia, now known as Supplee Hardware Company. Afterward he began to travel for the Star Rubber Works, but his longest and best service in his business life had been with the Hero Fruit Jar Company, Philadelphia, with which he had been identified for about 20 years.

As a traveling salesman of the first class he visited the best trade in the entire country from ocean to ocean and from Canada to the Gulf. His was naturally an exceedingly genial and happy disposition, and a trait of his character was the faculty he had of imparting to many with whom he came in daily contact much of the warmth and sunshine of his own personality. He always saw the brightest and best side of life and was ready to help those who deserved it. He will be sincerely missed

JOHN L. CHAPMAN.

by a large circle of warm personal friends in the trade.

Mr. Chapman was a Mason, belonging to both Palestine Commandery, K. T., and Crescent Temple, Ancient Arabic Order of the Nobles of the Mystic Shrine. He is survived by a widow and one daughter.

MAINE MFG. COMPANY'S CATALOGUE.

MAINE MFG. COMPANY, Nashua, N. H., has issued its catalogue of White Mountain Refrigerators and Ice Chests for the season of 1906. The company's complete line is shown, the Stone White line being given special prominence. This line was put on the market last season for the first. The lining is a glistening, smooth white surface and is made a part of the stone by a special process.

W. J. LOCKWOOD, on the evening of January 2, celebrated the twenty-fifth anniversary of his association with the house of John H. Graham & Co., originally Graham & Haines, as a traveling salesman, by giving a dinner at his home, 387 Clinton avenue, Brooklyn, N. Y., to the principals and employees of the house. Mr. Lockwood made an appropriate address, sketching the past history of the house and expressing hopes for the future. The firm presented him with a handsome silver service, and from the employees there were four silver candlesticks for table decoration, testifying to the high esteem in which Mr. Lockwood is held by his associates in business.

Post Check Currency.

FROM OUR REGULAR CORRESPONDENT.

WASHINGTON, D. C., January 9, 1906.

THE various parcels post bills favored by the Postal Progress League, the catalogue houses and other allied interests having been presented in the House the attention of these promoters has been turned to another feature of the "postal reform" programme—namely, the authorization of a system of so-called post check currency; and on the eve of the Congressional recess Representative Gardner of Michigan introduced an elaborate bill "to prevent robbing the mail, to provide a safer and easier method of sending money by mail and to increase the postal revenue."

This high-sounding title is employed to cover the project of C. W. Post and other "public spirited" individuals who have long schemed to devise some method by which the farmer and the recident of the small rural community could more easily send his money away from home. It is of course obvious that the catalogue houses would be the greatest beneficiaries of any such legislation, and these institutions find much cause for satisfaction in the announcement in Postmaster-General Cortelyou's annual report, recently made public, that he has appointed a commission to consider the advisability of recommending legislation for the creation of a post check currency system.

The Gardner Bill Proposes

that all paper currency hereafter issued by the United States of the denomination of $1, $2 and $5, except national bank notes, shall be of the form to be known as post check notes and may by the holder thereof be made payable to any named payee, as provided by the terms of the bill. The scheme in its entirety is set forth in Sections 2, 3 and 4 of Mr. Gardner's bill, as follows:

Sec. 2. That the paper currency of said denominations hereafter issued by the United States shall contain, in addition to the recitals and provisions now required by law, appropriate blank spaces on the face thereof in which the holder may write his name and the name of a payee, and also a space wherein the payee upon payment thereof may write his own name as a receipt, and also a space wherein a postage stamp may be affixed; and said currency shall also contain in plain letters on the face thereof the words "Post check note" and the words, "Before sending through the mails write name of sender and payee in designated blanks," and the space for the postage stamp shall contain the words, "Place here a two-cent postage stamp and write thereon initials of sender in ink before filling blanks, under penalty of ten dollars"; and for the clause making said currency payable to bearer shall be substituted a clause making it payable to bearer if said spaces be not filled, otherwise to the payee named thereon.

Sec. 3. That the owner of any post check note may make the same payable to a named payee by writing legibly, in ink, in the spaces provided, his own name and the name of such payee; but before filling said spaces the owner of said post check note shall affix in the proper space a two-cent United States postage stamp, and shall write thereon, in ink, his initials; and if any person shall fill or partly fill any space intended for a name or address and shall transmit or attempt to transmit the same through the mails without first affixing said two-cent postage stamp and writing thereon as herein provided, such person shall be deemed guilty of a misdemeanor, and upon conviction thereof shall pay a fine of not more than $10, at the discretion of the court.

Sec. 4. That any post check note, when transmitted as hereinbefore provided and presented by the payee or sender named thereon, shall be exchangeable at any money order post office of the United States for current funds, and when so exchanged shall be canceled by the postmaster with a canceling and dating stamp bearing the date of such exchange, after which said post check note shall no longer be valid for circulation, but the postmaster shall forward the same to the depositary designated for his office by the Postmaster-General and shall receive credit therefor as for other money deposited. Depositaries receiving such canceled post check notes shall forward them through the usual channels to the Treasury Department for exchange, as in case of other currency unfit for circulation; and postmasters of money order offices of the fourth class shall be entitled to include in their statements of cancellation of postage stamps, for the purpose of fixing their compensation, the face value of the stamps upon all post check notes canceled by them; and any post check note, when transformed as hereinbefore provided and presented by the payee or the sender named thereon, shall be redeemed by the Treasurer of the United States or assistant treasurers, as provided by existing law and the regulations of the Treasury Department issued thereunder, in like manner as if said spaces were unfilled; and if any post check note be mutilated or shall become unfit for circulation it may be exchanged for a new post check note of like kind and denomination, as provided by existing law and the regulations of the Treasury Department issued thereunder, as in case of other currency unfit for circulation; provided, that where the spaces thereon shall be filled or partly filled the owner shall affix and write his initials on a two-cent United States postage stamp, as hereinbefore provided.

To Facilitate the Redemption

of post check notes Mr. Gardner provides that they shall be bankable after having been filled out, but for the "sole purpose of securing the redemption by the United States Treasury and not for the purpose of further circulation." The bank in which the post check currency is deposited is required to cancel it and forward it to the Treasurer of the United States or to the Assistant Treasurers for exchange, and shall be entitled to use the mails free of postage and to register all packages of currency without charge, "with all the benefits provided by law for registering mail matter, including a limited indemnity for loss," and the currency forwarded by the Treasury Department in exchange for such canceled post check currency "shall be entitled to the like privilege of free postage and free registry."

Mr. Gardner's bill has been referred to the House Post Office Committee and the literary bureau maintained at Washington by C. W. Post, the officers of which are ex-employees of the Government, is preparing to bring all possible pressure to bear to secure favorable action at the present session.

The Records of the Post Office Department

contain some highly interesting data, the substance of which should be kept in mind when considering the so-called "demand" for post check currency. Postmaster-General Bissell, one of the ablest men who ever filled this office, in the course of his annual report for the fiscal year 1893 commented upon the uselessness of the postal note then current and made the following recommendation:

It has been suggested that the postal notes have outlived their usefulness and should no longer be issued; also, that the rates charged for all domestic money orders should be reduced and the form of the order simplified. I believe these changes would be desirable and that the revenues would more likely be increased than diminished thereby.

Congress at its next session discontinued the postal note and authorized a reduced schedule of fees for money orders, thereby enabling the public to purchase money orders for amounts up to $2.50 for a fee of 3 cents, the fee previously charged for postal notes. It is thus perfectly obvious that the postal note experiment, after a thorough trial, proved a failure and that Congress then reduced the money order fee to a point low enough to remove any just cause for complaint on the part of the public. The money order system has proved a success, and outside of a few special interests that would be large beneficiaries in the event of the authorization of a post check currency there is now no real demand from any source for further experiments in this direction.

W. L. C.

COLT'S FIREARMS CATALOGUE.

COLT'S PATENT FIREARMS MFG. COMPANY, Hartford, Conn., has issued a catalogue descriptive of Colt Revolvers. It represents New Service, New Service Target, New Army, New Navy, Marine Corps' Model, Officers' Model Target, New Police, New Police Target, Police Positive and New Pocket Double Action Revolvers, all with jointless solid frame, simultaneous ejection; Double Action Revolvers, .38 and .41 caliber, with and without ejector; Single Action Army, Bisley Model and Bisley Model Target, Single Action Revolvers, Automatic Colt Pistols, &c. The company's arms are guaranteed for the use of standard factory loaded ammunition, either black or smokeless powder.

JOHN B. FREYSINGER, who has been connected with Sargent & Co., New Haven, Conn., in various mechanical capacities in the manufacture of Builders' Hardware for over 17 years, has severed his relationship with that company.

THE MUTUAL MFG. COMPANY.

THE MUTUAL MFG. COMPANY, Neosho, Mo., composed of retail dealers of Kansas, Missouri, Oklahoma, Indian Territory and Arkansas, will exhibit its Wagons and Wagon Trucks in the banquet room on the fifth floor of the Midland Hotel, Kansas City, Mo., during the convention of the Western Retail Implement, Vehicle and Hardware Association, January 16, 17 and 18. The company will have its plant completed by March 15, equipped with the latest and most approved machinery. The buildings will be of brick and consist of one 60 x 300 feet, one 50 x 150 feet, one 50 x 60 feet and one 20 x 40 feet, located in one of the best timber districts in the country. The company expects to commence building other factories in April next.

This company has been organized for the benefit of its stockholders and to show retail dealers what can be done by a thorough systematic organization. Eventually it is designed to take in all good retail dealers that wish to join it. It has not been organized to fight trusts, manufacturers or jobbers, nor is it in any way connected with any retail dealers' association, and while some of its stockholders are old members of the retail dealers' association the latter as an association is not supporting the company in any way whatever, it is stated. The officers of the company are : E. R. Moses, president, Great Bend, Kan.; J. F. Steele, vice-president, Parsons, Kan.; F. S. Briggs, secretary; Ed. Haas, treasurer, and F. E. Montee, manager, Neosho, Mo.

SOLID STEEL TOOL & FORGE COMPANY.

JAMES D. WILSON, receiver of the Solid Steel Tool & Forge Company, Tarentum, Pa., offered the plant at public auction last week, but as the highest bid made was only $75,000 the receiver did not feel justified in accepting it and the sale was adjourned. We are advised that this plant, under the management of James H. Baker, formerly president of the James H. Baker Mfg. Company, has been running steadily for some months, the earnings being large and the plant full of orders. In fact, the general conditions are such that the receiver is regarded as having been amply justified in refusing the price offered for the property, which for some months has been earning a large rate of interest on the investment. Mr. Wilson was recently authorized by the courts to operate the plant as receiver until April 1, and it is not likely that any change in the ownership of the works will take place before that date.

STANDARD CHAIN COMPANY.

THE hand made Chain department at the Columbus works, Columbus, Ohio, of the Standard Chain Company, is now in full operation. The old employees, who went out on a "sympathy" strike in August last year, returned to work last week. All of the other plants of the Standard Chain Company that make machine made Chain have been in operation for several months, with a gradually increasing force. The company desires to express its thanks and appreciation to its customers for their leniency in bearing with the delays incident to the strike, and now that the last shop is in operation the company will very shortly be in position to make prompt shipments of all orders. The contention between the company and its employees was on the "open shop" question and after a somewhat bitter struggle it has successfully carried its point.

L. W. STEWART, who for a number of years has called on the Hardware jobbing trade in the Middle West in the interest of J. C. McCarty & Co. of New York City, began business for himself January 1 as a Hardware manufacturers' agent. Mr. Stewart will cover personally his old territory, as well as the States of New York and Pennsylvania, and will represent the Dana Mfg. Company, Cincinnati; the H. C. Tack Company, Cleveland; Ohio Tool Company, Columbus, and the Avery Stamping Company, Cleveland. His office will be 1206 Mercantile Library Building, Cincinnati, Ohio.

CONTENTS.

THE EFFECT OF COMBINATIONS AND CONSOLIDATIONS UPON THE HARDWARE TRADE.

BY A. W. DOUGLAS OF SIMMONS HARDWARE COMPANY, ST. LOUIS.

SHORTLY after the end of the Spanish War there ensued a regular craze for consolidations among many important lines of Iron and Steel manufactures and the consequent result has been an epoch making era in the history of the Hardware trades. It mattered not how waterlogged a concern was nor how unfit to exist, it went into the combination on terms that usually made its owners rich, even though they were paid in the heavily watered stock of the new consolidation.

THE STORY OF THE INFLATED STOCKS

that were unloaded upon an eager public, the disgraceful bargains (some of which are only now coming to light), the mad stock jobbing craze that swept over the country are all only too fresh in the minds of a once eager but now sorely bitten public. The theory of consolidations, true enough in itself, was so madly perverted as to raise a universal outcry against "trusts" all over the country.

Time, the sure leveler of all things, has brought about the "survival of the fittest," and those consolidations that still live have given good reason for their existence and bid fair to be enduring factors in commercial history. Their influence is widespread and, while they do not monopolize, they so dominate the market in their particular lines as practically to control the situation.

MARKET STABILITY.

They have undoubtedly given stability to the market at critical times in a manner that has been of widespread benefit. Not only have they sustained the situation in times of depression and prevented a repetition of panic prices and of consequent disaster, but they have likewise prevented in good times a runaway market with its inevitable reaction.

Not very long ago it was a matter of common remark that the leading interest could easily have gotten several dollars per ton more for most of its products, but it took a long headed view of the situation and kept prices well within bounds, in order that healthy consumption might not be checked.

Apparently also the feeling was entertained that it was not wise to build up competition unduly and the policy pursued seems to be one of keeping its mills running full at such cost as may be necessary. Therefore at times there have come such drops in prices as have made independent mills feel the pressure very sharply.

To the credit of these consolidations in general it must be said that they have conducted their dealings with the trade on strictly business principles and with a good deal of consistency, considering the numerous difficult problems they are constantly called upon to solve.

FORTUNATELY FOR ALL CONCERNED

there is always enough outside competition to act as a check upon the natural tendency of all combinations to be arbitrary and exacting, and any pronounced departure in this direction would inevitably bring new and more formidable competition into the field.

To the extent that the consolidations display liberality and fair treatment to their customers will be the measure of their hold upon the trade.

A MOST NOTABLE POLICY

has been their general practice to largely distribute their products through the jobbing trade, as against the opposite previous practice in this respect of many of the units who now make up the total aggregation. This policy evidently has no other foundation than the conviction that such are the natural and most economical methods of distribution, and has, with few exceptions, been persevered in despite the generally opposite practice of the independent mills.

QUALITY OF GOODS BETTERED.

In some lines of consolidation there has been another change for the better in the general uplift as to the average quality of the goods, greatly to the benefit of all concerned. Some "shady" practices and much misrepresentation has thus effectually been disposed of.

As a rule, these consolidations have steered clear of that vexed question—the restricted selling price system—notwithstanding the constant pressure that has been brought upon them to formulate such plans.

JUDGED UPON THEIR MERITS.

Among the trade the prejudice against consolidations as such seems largely to have died away, and in its stead has arisen a feeling that they should be judged solely upon their merits as business institutions. It is certainly noticeable that the various consolidations in the steel and iron manufactures seem largely to have escaped much of that public feeling that is directed so strongly at present against certain other consolidations in other lines of business.

TEMPORARY AGREEMENTS OR POOLS.

The desire to consolidate all existing lines in one large aggregation seems temporarily to be in abeyance as compared with the present tendency of manufacturers in competitive lines to associate in temporary arrangements or pools. Experience seems to have taught manufacturers but little as to the ultimate outcome of almost every arrangement of this nature, for by many they are regarded as the only escape from a destructive competition.

This is true temporarily, but the usual story is the building up of new competition that makes the last state of that pool worse than the first. Where they put up prices unduly—as is almost invariably the case—competition springs up so fast that they soon lose control of the market, and then their days are numbered. A pool, to be effective for any length of time, should be a fighting machine as well as a money making one, but it rarely is. The reduction in its prices is usually the prelude to its dissolution.

CONSOLIDATION OR DISSOLUTION.

The consciousness that it is largely a makeshift and consequently but of comparatively temporary duration prevents its grappling and solving satisfactorily the various problems which encumber its career. The lack of concentrated authority prevents the adoption of any far-sighted policy, and its consequent compromises prevent it from getting the following and confidence of the trade.

It often thinks its life depends upon the adoption of the restricted selling price system, and then its troubles begin. From its transitory nature it can never be a satisfactory solution of the question of competition, since in its present shape it must eventually either go forward to actual consolidation, which it rarely does, or else backwards to dissolution, which is usually its fate.

ARTIFICIAL STIMULUS UNNECESSARY.

Its effects upon the trade therefore are but transitory and rarely of any permanent good. In view of the present feeling among many manufacturers as to the necessity of pools to preserve profits, it is noteworthy that some of the strongest and most prominent manufacturers have consistently refused to enter any pools or price arrangements, and have worked out their own salvation without the aid of such artificial stimulus. It is usually a good plan to let nature take her course.

It may be summed up briefly that the effect upon the trade of the large consolidated interests in iron and steel manufactures has been most noteworthy and is deserving of our careful study, while that of mere pools or selling price agreements is but temporary and usually leaves the situation worse than it was in the beginning.

A W Douglas

RICHARD L. THOMAS having become second vice-president of the B. M. Jones & Co., Incorporated, Boston and New York, has severed his connection with the National Lock Washer Company, Newark, N. J. Mr. Thomas will devote his entire attention to the duties of his new position.

A RETROSPECT.

BY VIATOR.

SINCE the first publication of *The Iron Age*, 50 years ago, many changes have taken place. Gold, Platt, Pearl, Beekman and Cliff streets, then the homes of the Hardware fraternity, have been deserted and the trade transferred to Chambers, Warren, Murray, Duane and Reade streets. The initial step in this movement was taken by the Russell & Erwin Mfg. Company. As there is a strong probability that the city will condemn the block on Chambers street, between Broadway and Centre street, for municipal buildings, the company may be forced to again lead in the establishment of a new Hardware center.

MANY HONORABLE NAMES

have in that period passed out of existence, some of which will be remembered by the present generation, such as Hart, Bliven & Mead, Beam & Murray, George W. Bruce, Coffin, Lee & Co.; also Walsh, Coulter & Flagler, Wm. Bryce & Co., Louderback, Gilbert & Co., George W. Albortus and Thomas McLean & Co. Most of these were engaged in the jobbing business, sending their emissaries to the West, South and East, but the aggressive Hardware giants, with their modern methods, in St. Louis, Chicago, Milwaukee, St. Paul, Minneapolis, Duluth, Cleveland, Pittsburgh, Denver, San Francisco, &c., have made it impossible for them to compete.

UP TO THE EIGHTIES

the Boston jobbers sent their salesmen to the Far West and South, but they, too, had to succumb to the pressure and must now be content to operate in Massachusetts, Maine, New Hampshire, Vermont and Connecticut. Then Philadelphia, too, reached all over the land, but now confines its jobbing operations to Pennsylvania, Delaware and western New Jersey.

Some years ago, on a visit to Duluth, Minn., one of the leading Hardware jobbers asked me to step to the back part of his store, which faced Lake Superior. At his dock lay a Cleveland steamer loaded with Nails. They were rolled directly from the steamer into his cellar. He informed me that the freight was 10 cents per keg from Cleveland, Ohio, a distance of about 1000 miles. Under such transportation conditions how could the New York jobbers hope to compete?

CINCINNATI'S DOMINATION

Up to the early seventies Cincinnati was the greatest Hardware distributing point in the West. Pearl street was full of Hardware jobbers, such as Perin, Gaff & Co., R. W. Booth & Co., E. G. Leonard & Co., L. Pappenheimer & Co. and a number of others. Cincinnati is on the banks of the Ohio River, connecting with the Mississippi and Missouri rivers, reaching from Pittsburgh to New Orleans, thence up to St. Paul via the Mississippi River, and North Dakota via the Missouri, the most fertile territory in our land, but with all the advantages of cheap transportation, old prestige and abundant capital, the jobbers of Cincinnati have allowed St. Louis to practically wipe them out of existence.

ST. LOUIS AND CHICAGO.

A St. Louis jobber is now doing business from the Atlantic to the Pacific, and from Maine to the Gulf. By superior generalship and aggressive methods they sell goods manufactured in the Nutmeg State, even to the dealers in Connecticut, and, best of all, they never fail to declare dividends. This is an age of aggressiveness and nerve. They simply do things. When I was a Knight of the Grip "some 15 years ago" they gave me one order amounting to $40,000, and thought nothing of it. Of course, they were entitled to a greater discount than the Eastern jobber who considered a $500 order somewhat unusual. The extra discount enabled the St. Louis jobber to undersell his Eastern brother.

Chicago is a close second, but its jobbing territory is practically limited to the great Northwest and the States of Illinois, Iowa and Michigan.

THE CHICAGO FIRE

brought out the nerve of the Chicagoan, and he was at that time the wonder of the world. He arose from the ashes better equipped than ever. His failure to collect his fire insurance compelled him to ask for accommodations in the East, and they were granted in every case without a murmur.

I happened to be in Chicago on the day of the fire. It was a sight never to be forgotten. Miles of property in ashes. Tens of thousands homeless. The business district practically erased. During that terrible conflagration Hibbard, Spencer & Co. found a printing shop from which they issued a circular to their customers that Mr. Hibbard with a staff of clerks would start for New York that night to open headquarters and that orders would be filled as usual. This was indeed nerve under the most trying misfortunes, and an illustration of Americanism which has made our land the wonder of the world.

PACIFIC COAST CHANGES.

Great changes have taken place on the Pacific Coast. In the early seventies I made semiannual trips to the Coast—July and January. Most of the bulky goods were then shipped by clipper via Cape Horn, and the orders I booked in July had not arrived when I turned up again in January. All these goods had to be paid for in 30 or 60 days; besides, the Pacific jobber had to extend a credit of two or three months. Of course he charged large profits, but it required a large capital to carry on a jobbing business.

All this has been changed. By reason of the keen competition between the Southern, Union Pacific and Northern Pacific railroads the Californian or Oregonian not only enjoys a lower rate of freight but he can receive his freight in about three weeks. This condition has reduced the old-time working capital to an almost Eastern basis, but has also reduced the profits from the neighborhood of 100 per cent. to about 15 or 20 per cent.

BUSINESS METHODS

have materially changed in these 50 years. Of old, the funny story, the cup or cigar were a necessary introduction for a salesman. To-day it is simply a question of quality of goods, satisfactory prices and the ability to promptly deliver goods. The initiative of this change may be traced to a jobbing house on the Mississippi River. To-day the "knights of the grip" are younger men who work smaller territories and are content with smaller compensations.

VETERAN SALESMEN WHO HAVE PASSED AWAY.

In olden times the business was largely done on a basis of friendship and some of the old veterans controlled a very large business. Many of these have passed away. John G. Witte always carried a monkey or a squirrel or a white mouse in his inside pocket to amuse his friends, and he served a lunch with sparkling wines and other concoctions at his hotel sample rooms. His visits were quite an event. He was known all over the land as a somewhat eccentric but successful salesman. Ed. Bernard of Parker Coffee Mill fame was very solid in the South, having visited that part of the country upward of 30 years. He is no more. We miss John Cantwell of St. Louis, who in his day was considered an authority on Hardware.

DOMESTIC TRIUMPH.

Up to the seventies tons of Butcher's Files and Spear & Jackson's Saws were imported. There was generally a scramble for these goods upon the arrival of steamers, for the Sheffield manufacturers could not cope with the demand. To-day we are sending American Files and Saws to Sheffield.

Birmingham supplied us with enormous quantities of Trace and Coil Chains, but American machinery wiped out the English makers in those lines.

Sheffield Cutlery, with the exception of one or two well-known brands, finds no market here, and the old-time enormous importations from Germany have dwindled down to three and four blade Knives and a small line of Ladies' and cheap Boys' Knives.

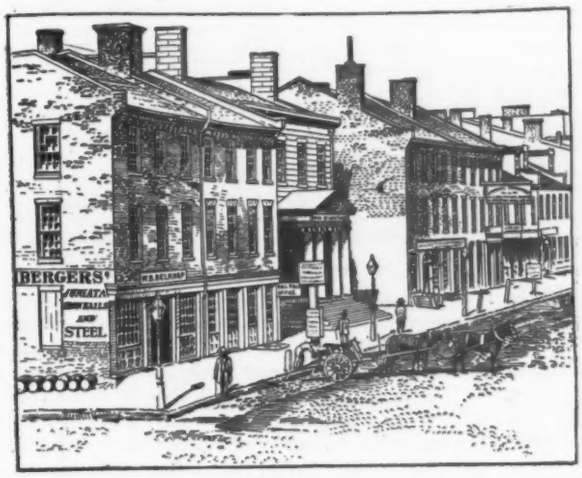
Up to the eighties, when an American buyer arrived in Solingen, there was a great excitement among the German Cutlery manufacturers and a scramble to secure his order. To-day he would not create a ripple.

The Iron Age has weathered all storms. Its policy of a "square deal" and conservative enterprise has done much in the upbuilding and development of metal trades. It is to-day a welcome weekly visitor in every part of the globe wherever metals or Hardware are manufactured or sold.

THE BELKNAP HARDWARE STORE IN 1850.

WHAT is now the great house of Belknap Hardware & Mfg. Company, Louisville, Ky., was founded in 1840 by W. B. Belknap, father of W. R. and Morris B. Belknap, respectively the present president and vice-president of the company. Herewith we give a view of a portion of Main street in that city as it appeared in 1850, 10 years after Mr. Belknap had embarked in business. His store was at the corner of Third and Main streets, the Bank of Kentucky and the printing office of the *Journal of Commerce* being on the same block on Main street. The corner opposite, to the west, not shown in the picture, was then occupied by Wallace & Lithgow, who were large Stove manufacturers and founders.

Mr. Belknap was at this time agent for the Shoenberger Juniata Iron Nails. The steel which appears on



The Belknap Hardware Store in 1850.

the corner sign referred to Naylor's English Cast Steel, which was carried in stock. Mr. Belknap occupied the store between his corner and the Bank of Kentucky on the first floor only, as storage for painters' Hoop Iron a little later. The second floor was a railroad office and the third was occupied as sleeping room by clerks, which was the usual plan of keeping store in those days, even in the wholesale quarters.

The tandem dray which is seen loading in the foreground was one of three which were managed by a free negro man of considerable ability. The hauling was done almost exclusively to and from the wharf-boat, which was moored at the bottom of the street about two ordinary blocks below this corner. The quarters of the company have been moved twice since the occupancy of its old original corner here shown, once a half square below between Third and Fourth streets and in 1884 to its present location between First and Second streets.

This three-story brick building of very limited space is in marked contrast with the numerous warehouses of the company's present plant, covering acres of ground along Washington street from Second to Brook streets, including a seven-story reinforced concrete building now in course of erection at Second and Main streets, which will be completed about May 1. This structure will be 135 x 190 feet and will be a model of its kind. When it is ready for occupancy the large office force, for which exceptional accommodations are being provided, will be moved from the present headquarters and that building turned over for exclusive warehouse use.

THE NAIL AND WIRE MARKET IN 1905.

THE year opened with the market in excellent tone with the following base prices in force for carload lots, f.o.b. Pittsburgh: Wire Nails, $1.75; Painted Barb Wire, $1.90; Smooth Fence Wire, $1.60. These prices continued in force until the early part of February, 1905, when an advance was made of $1 per ton, which brought the base price of Nails to $1.80. These advances applied also to Barb and Smooth Fence Wire. The opening of 1905 saw a continuation of the entire demand which has characterized the market for a month or more previous in anticipation of a further advance. This price continued nominally in force until September 11, when the American Steel and Wire Company made a readjustment of prices. This was apparently a reduction of 5 cents per keg, but was in reality an advance of 5 cents, as the open or official quotations had become nominal from the frequency with which concessions were given. For two months or more previous to this reduction competition between manufacturers had been very keen, resulting in concessions in prices being made in freight deliveries and in other ways, bringing the actual price down to $1.70. This price was not infrequently made to jobbers, and in some instances to single carload buyers. In September the price of Nails was made $1.75, with corresponding prices for Wire. These prices continued in force until the last of the month, when an advance of $1 per ton took place. This price continued during the balance of the year.

Steel Cut Nails.

The year 1905 opened with a fairly active demand on a base price of $1.75 for carload lots, f.o.b. Pittsburgh. On February 1 prices were advanced to $1.80, base, following a similar advance in Wire Nails. Current demand was fair, but mills were engaged largely on old contracts. During the dull period caused by the backward spring and during the summer prices gradually receded from $1.80 to $1.60, base. Improved demand in the fall months and the higher price and scarcity of steel gave the market additional strength after prices had reached the lowest figure. At a meeting of the Cut Nail Association held the last of September the selling price was fixed at $1.65, base. The announcement of a definite price imparted further strength to the market, and in the early part of November some manufacturers expressed a disinclination to dispose of their product at a lower figure than $1.70, base. During November liberal contract orders were placed as a result of market conditions and an advance to $1.70, base, was made by the association at a meeting held on November 30. Early in December some manufacturers with well filled order books were quoting $1.75, base. Demand throughout the greater part of the month was fairly active with a firm market. Some difficulty was experienced in getting raw material.

GEO. BORGFELDT & CO.'S SILVER ANNIVERSARY.

IN commemoration of the twenty-fifth anniversary of the founding of their business Geo. Borgfeldt & Co., New York City, dealers in foreign merchandise, have issued a beautifully printed souvenir volume, in which the development of the enterprise and an outline of its purpose and its methods are sketched, with scores of portraits of the officers, branch house and department managers and selling and office forces. Views are also presented of different departments in the main building at West Fourth, Third and Wooster streets, New York, and of the branches in the United States and Canada at Boston, Chicago, St. Louis, San Francisco, Toronto and Montreal, and of the European branches at Berlin, Paris, Vienna, Sonneberg, Furth, Bodenbach, Barman, Birmingham and Limoges.

J. G. PHELPS, for the past four years superintendent of the Grand Rapids Brass & Iron Bed Company, Grand Rapids, Mich., has severed his connection with that company to engage in business as manufacturers' agent for western Michigan. Mr. Phelps' headquarters will be at Grand Rapids.

MANSON'S DELIVERY RECORD.*

THE accompanying reduced reproductions of records show the various stages in filling out a page of the Delivery Record arranged by John A. Manson, a well-known and successful Hardware merchant of Burlington, Vt. The book is 7 x 12 inches in size, bound in canvas and heavy manila covers. One edition contains 60 leaves for 120 records, bound in heavy manila paper; the other edition has 100 leaves for 200 records and is bound in canvas covers. With this book in use

ALL TRANSACTIONS CAN BE FOLLOWED UP

systematically—every entry is called to account and records are obtained showing that all delivery charges and cash sales have appeared in the charges and cash sales of the day. The object in indicating in "What" column the nature of the goods or the customer's order number is to identify that transaction. Should any question come up regarding the delivery of an order reference to the book gives particulars. In many businesses more than one carter is employed who makes deliveries; under "Delivery" is noted who delivered, so that when carters' bills are brought in a check-up on each delivery is readily obtained. The book can be used to record any kind of delivery transaction that is apt to come up in store, shop or factory.

Referring to the illustrations, which represent one page of the book, the significance of the various headings will be seen. Under "Date" is noted the month and day;

DATE		WHO	WHAT	WHERE	WHEN	DELIVERY			TRANSACTION	REVIEW CHECK
						WHEN	HOW	CHECKED BY		
May	25	H. E. Thomas	Tools	99 Hickok St.	9 a.m.				C.	
		Otter Lumber Co.	Order No. 5741	Mill	10 a.m.				b.	
		R. J. Jones	Roofing for Credit	16 Elm St.	to-day				R.	
		F. M. Godfrey	Machine Screws	26 Penn St.	a.m.				b.	
		Simons & Rand	Belting - due $6.25	T. B. & F.	to-day					
		Richards Mfg. Co.	Nails & Hangers	Shelburne Vt. 6 P.M.	to-day				b.	
		Horace Black	Paints	T. B. & F.	to-day				b.	
		Geo. Kalton	Shovels	T. B. & F.	Soon				b.	
		J. Lafrance	Lawn Mower $4.00 Collect	26 Allen St.	3 P.M.					
		Mrs. G. Henry	Sad-irons in exchange	T. B. & F.	P.M.				N.	
		James Drew	Pack Faucets	3 Buell St.	P.M.				b.	

Fig. 1.—Delivery Record, Showing Entries.

DATE		WHO	WHAT	WHERE	WHEN	DELIVERY			TRANSACTION	REVIEW CHECK
						WHEN	HOW	CHECKED BY		
May	25	H. E. Thomas	Tools	99 Hickok St.	9 a.m.	9 a.m.	Landon	Prouty	C.	
		Otter Lumber Co.	Order No. 5741	Mill	10 a.m.	10 a.m.	Muir	Prouty	b.	
		R. J. Jones	Roofing for Credit	16 Elm St.	to-day	3 P.M.	Landon	Prouty	R.	
		F. M. Godfrey	Machine Screws	26 Penn St.	a.m.		Void.		b.	
		Simons & Rand	Belting - due $6.25	T. B. & F.	to-day	11 P.M.	Simons	Prouty	C.	
		Richards Mfg. Co.	Nails & Hangers	Shelburne Vt. 6 P.M.	to-day	1:30 P.M.	Muir	Prouty	b.	
		Horace Black	Paints	T. B. & F.	to-day	2:30 P.M.	Self	Prouty	b.	
		Geo. Kalton	Shovels	T. B. & F.	Soon				b.	
		J. Lafrance	Lawn Mower $4.00 Collect	26 Allen St.	3 P.M.	3 P.M.	Landon	Prouty	C.	
		Mrs. G. Henry	Sad-irons in exchange	T. B. & F.	P.M.	4 P.M.	Self	Prouty	N.	
		James Drew	Pack Faucets	3 Buell St.	P.M.	3:30	Jones	Prouty	b.	

Fig. 2.—Delivery Record, Showing Entries and Deliveries.

DATE		WHO	WHAT	WHERE	WHEN	DELIVERY			TRANSACTION	REVIEW CHECK
						WHEN	HOW	CHECKED BY		
May	25	H. E. Thomas	Tools	99 Hickok St.	9 a.m.	9 a.m.	Landon	Prouty	C.	5/25
		Otter Lumber Co.	Order No. 5741	Mill	10 a.m.	10 a.m.	Muir	Prouty	b.	5/25
		R. J. Jones	Roofing for Credit	16 Elm St.	to-day	3 P.M.	Landon	Prouty	R.	5/25
		F. M. Godfrey	Machine Screws	26 Penn St.	a.m.		Void.		b.	5/25
		Simons & Rand	Belting - due $6.25	T. B. & F.	to-day	11 P.M.	Simons	Prouty	C.	5/25
		Richards Mfg. Co.	Nails & Hangers	Shelburne Vt. 6 P.M.	to-day	1:30 P.M.	Muir	Prouty	b.	5/25
		Horace Black	Paints	T. B. & F.	to-day	2:30 P.M.	Self	Prouty	b.	5/25
		Geo. Kalton	Shovels	T. B. & F.	Soon	forward.			F.	5/25
		J. Lafrance	Lawn Mower $4.00 Collect	26 Allen St.	3 P.M.	3 P.M.	Landon	Prouty	C.	5/25
		Mrs. G. Henry	Sad-irons in exchange	T. B. & F.	P.M.	4 P.M.	Self	Prouty	N.	5/25
		James Drew	Pack Faucets	3 Buell St.	P.M.	3:30	Jones	Prouty	b.	5/25
May	26	Geo. Kalton	Shovels	T. B. & F.	Soon					

Fig. 3.—Delivery Record, Showing Transactions Checked in Full for May 25.

* Published by David Williams Company, 14-16 Park place, New York. Canvas cover, $1. Heavy manila cover, 50 cents.

"Who" gives the customer's name; "What" the nature of the goods ordered; "Where" the place of delivery or place of business; "When" the time goods are wanted.

The foregoing are the essential particulars regarding the entry of an order for delivery. Under "Delivery" are the following divisions: "When," under which is noted the time of delivery; "How," the name of the carter, messenger or customer who took the goods, or if they were sent by freight, express or mail; "Checked By," the name of the person who checked the goods out of the place of business.

The orders of the day, those left by customers, those received by mail, telephone or telegraph, are at once entered, as shown in Fig. 1, and then handed out to be filled. It is suggested that in an ordinary business deliveries should be superintended and checked out by one person, who sees that the proper entries regarding deliveries are made and who uses the book as a follow-up on every transaction.

In Fig. 2 the record shows the entries and deliveries. The key to the nature of the transaction is as follows: "C" for charges, "P" for payment, "R" for goods returned for credit, "N" for no charge, "V" for void, "F" for forward. The letters "T B C F." are used in the "Where" column to indicate that goods are in the place of business and are to be called for.

The transactions checked in full for the day are shown in Fig. 3. The person who reviews the business of the day notes under "Review Check" the date when each transaction was verified with the day's charges and cash sales, or became void, or was disposed of, or was carried forward. In an ordinary business all orders not disposed of should be carried forward once a week.

AUSTRALIAN NOTES.

(*From Our Special Correspondent.*)

MELBOURNE, November 24, 1905.

UNSEASONABLE weather—and weather is the chief factor in trade considerations out here—has again retarded the volume of business. Rain and winter weather are still with us instead of the well advanced summer season, which the date above should warrant us in expecting. Consequently wholesalers and retailers alike are finding things on the slow side. The building trade is the one hopeful feature at present and is brisk in all the States.

The year 1905, which will be closed by the time this reaches New York City, has been disappointing on the whole. Trade throughout has been merely normal, and there is no reason to expect that 1906 will yield any extraordinary demand in any line.

In my opinion the American Harvester must go, or its alternative to retain its hold in Australia will be to manufacture locally. The methods of the International Harvester Company are receiving ample free advertising in the Australian protectionist press, and public feeling is being strongly worked upon to compel the Australian Parliament to early action. The Federal Customs Minister quite recently forced up the amount of duty on imported Harvesters by 50 per cent. and the International Harvester Company promptly responded by a reduction in price to the amount of £12 10s. per machine. This amount, with the increased duty levied, nearly £3 per machine, means that the company is content to suffer an apparent loss (by comparison with former prices) of nearly £15 10s. on each machine sold here in future. This would seem to show immense profits in the past or a determination to wreck the market now in order to secure a monopoly later. Of course complete Harvesters are only one line, but the attention drawn to this particular branch of farm implements will probably have the effect of increasing the duties all around on such implements and machinery.

THE ANTHONY FENCE COMPANY, Tecumseh, Mich., through the local sale of $70,000 worth of additional stock will retain its factory at Tecumseh. The company had outgrown its quarters and was casting about for inducements which would permit of expansion in the business. The disposition of the stock in Tecumseh holds the factory at that place. The company will now increase its plant to a ten-loom factory and will build a $25,000 addition in the spring. Electrical power will be used and a complete machine shop equipment for repair purposes will be installed. The company is sending out souvenir pins showing the tie in its Fence. One is in the form of a hat pin and the other a scarf pin.

MISCELLANEOUS NOTES.

Braunsdorf-Mueller Company.

Braunsdorf-Mueller Company, Elizabeth, N. J., has issued a 24-page supplement to catalogue 3, illustrating a large number of mechanics' tools, many of which are new. Some of the latter are pin punches, router, extension handle carpet stretcher, adjustable blade washer cutters and ratchet screwdrivers.

Spring Balances and Scales.

Sargent & Co., New Haven, Conn., and 149-153 Leonard street, New York, have just issued a 60-page illustrated catalogue devoted exclusively to spring balances and scales. The line is greatly enlarged and improved and there are many changes in numbers, some of the old numbers now being applied to new goods of different styles. There are 47 pages of balances of varied kinds, scale beams, family, tea, counter and even balance scale, scale weights, and grocers', platform and portable platform scales in great variety.

Hardened and Tempered Washers.

The Wallace-Barnes Company, Bristol, Conn., manufacturer of small springs of every description, has recently issued an attractive folder announcing that it is now making a specialty of hardened and tempered washers and that it is equipped to furnish washers from 3-16 inch diameter, 0.010 inch thick, to 3 inches diameter, 0.125 inch thick, flat, cupped and with flanged sides.

Waterbury Rubber Mfg. Company.

The Waterbury Rubber Mfg. Company, 75 Warren street, New York, has recently announced that its Sphincter grip spring steel armored hose will in the future be made with a red cover to distinguish it from other brands.

Store Cases and Fixtures.

The Sun Mfg. Company, Columbus, Ohio, has made a number of additions to its line of store cases and fixtures. These are shown in its catalogue No. 26, and include knock down display cases, wall cases, cashiers' desks, floor cases; also camp stools. Cases can be supplied with electric light fixtures if desired. The company regularly carries a complete stock of all its goods and is generally able to fill orders the same day they are received. The point is made that this enables merchants who may have the misfortune to be burned out to procure cases and fixtures quickly.

Forest City Bit & Tool Company.

The Forest City Bit & Tool Company, Rockford, Ill., has included new patterns and made additions to its line, as shown in catalogue G, recently issued. These embrace ship auger machine bits, ship auger car bits, router bits and Forest City blind style bits.

Puritan Ware.

The Central Stamping Company, 24 Cliff street, New York, has just issued an illustrated price-list referring to a new line of pressed and recoated tinware known as Puritan ware. This is referred to as a product of the highest grade, being superior, in fact, to anything previously manufactured by this company. It is made of extra heavy tinned plates of highest quality and finish and is said to be as nearly rustless as is possible with an iron or steel base and metal coating. It is also claimed that its surface will not break, crack, scale or corrode. The capacity of the several articles follows the custom of the trade, and the statement is made that there are no

scant sizes or light weights, descriptions being actual and not to be deviated from. All knobs and wood handles on bails are of mahogany finish. Every article is wrapped in tissue paper, bears the special Puritan label and is strictly warranted. The company announces that it will soon publish an extended list of Puritan ware, covering the most desirable articles in other lines which it manufactures, including pieced, japanned and galvanized ware. The company is now completing a large addition to its plant in Newark, which will be devoted to the manufacture of Puritan ware and a new line of high grade enameled ware.

Miniature Razor and Valve.

Davison Mfg. Company has recently appointed Smith & Hemenway Company, 296 Broadway, New York, direct representative for the sale of its large line of miniature tools, for use as watch charms, &c., and to which a razor and a valve have recently been added. Other reproductions on a minute scale, but which are good working models in such goods as wrenches, for example, are hammers, drawing knives, cleavers, steels and various similar articles, finely finished in gold and silver plate, &c., designed for profitable retailing at 25 cents each.

Kid Covered Pocket Steel Tape with Stop.

The Lufkin Rule Company, Saginaw, Mich., and 280 Broadway, New York, has just added to its line of pocket steel tapes the No. 123½, which is exceedingly small and handsome in appearance. The tape, with stop, is about 5-32-inch wide and 36 inches long. The case itself is neatly covered with maroon colored kid and is only 1-16 x 5-16 inch in outer dimensions, thus affording an accurate pocket tape of very small size. The goods are daintily put up singly in double pasteboard boxes, covered with watered satin paper.

Covey Quick Shift Antirattler.

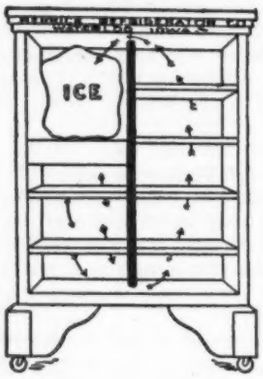
F. E. Kohler & Co., Canton, Ohio, manufacturers of hardware specialties, are offering the new quick shift antirattler here represented. It has malleable castings, steel bolt and springs of tempered steel wire. At the

Covey Quick Shift Antirattler.

right is shown the antirattler attached to axle, with the open position of the spring indicated by the dotted lines. At the left the spring and malleables are shown in detail. The article is referred to as affording a simple, durable and effective quick shift.

The New Herrick Refrigerator.

The accompanying illustration is an interior view of the new line of refrigerators now being placed on the market by the Herrick Refrigerator Company, Waterloo, Iowa. This line shows several changes, as compared with old styles, affecting the whole refrigerator in workmanship, material and general construction, and not only have improved ornamentation and greater durability been obtained but more economical refrigeration has been secured as well. In the latter respect a substantial saving has been effected in ice consumption. A glance at the illustration will show the small amount of ice required and the consequent large storage capacity of the refrig-



The New Herrick Refrigerator.

erator. While some people gauge the efficiency of a refrigerator by the ice capacity, carrying the idea that the larger amount of ice it holds the more valuable it is, the manufacturers of the Herrick have demonstrated in this line the successful operation of a refrigerator with a small amount of ice, thereby not exposing an unnecessary quantity at the sacrifice of the storage capacity. This new type of the Herrick make also possesses a perfected circulation system made up of open center draft pans, air ducts and other scientific construction. It is explained that a continuous, pure, cold, dry air current is forced through all compartments, removing all odors and gases arising from the articles stored and delivering them through a process of nature entirely outside of the refrigerator; keeping the walls dry, sweet and clean and affording proper sanitation and preservation of the articles stored. Another important feature is the insulation, the basis of which is a heavy packing of mineral wool 1½ inches thick. A high-grade material is used and is so packed in the walls that there is no chance for sagging, as it is held firmly in place. This heavy insulation contributes to the economical consumption of ice and is an important factor in reducing the operative cost. The cases of the refrigerators, with the exception of the two smallest sizes, are constructed of solid oak in a fine finish. The doors overlap, making them practically airtight. The trimmings are of a special design and the fasteners and hinges nickel plated. All the refrigerators are mounted on casters. The line is provided with an improved trap, made of heavy galvanized iron, which carries off the water from the ice pan, at the same time excluding any warm air which might work through from the outside. In the glass-lined refrigerators the drain tube is nickel plated. The trap can be quickly removed, cleaned and replaced. The pans used are constructed of heavy galvanized iron and are seamless. The new line is lined in spruce, enamel and opal glass and is built for residences, hotels, restaurants, clubs, grocers, dining cars and for other purposes.

Pin Punch.

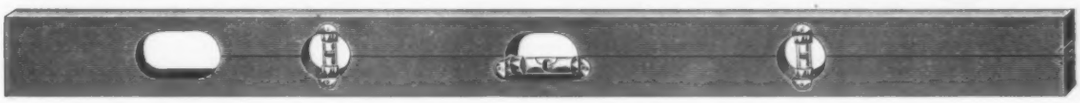
Braunsdorf-Mueller Company, Elizabeth, N. J., has recently begun the manufacture of No. 12 pin punches, as here illustrated. This punch is designed for driving out pins, cotters, &c., and is made of best tool steel, nicely

Punch for Driving Out Pins and Cotters.

knurled, carefully tempered and blued. The punch is 4½ inches in length and 5-16 inch diameter. The walls of the driving or small end are parallel for over an inch. The assortment is 3-32, ⅛ and 5-32 inch diameter of face.

Mason's Plumb Rules or Levels.

The Baker, McMillen Company, Akron, Ohio, represented by Warner & Haviland, 49 Warren street, New York, as sales agents, has supplemented an otherwise large line of plumbs and levels by the addition of two styles of plumb rules for masons, as here shown. The engraving illustrates the No. 35 rule or level, with two plumbs, a No. 25 being made with but one plumb and at a less cost. The outer dimensions are 48 x 3⅝ x 1 inches. The delicate spirit tubes are all inclosed in a heavy outer glass tube which makes them almost unbreakable, the outer tube being ⅝ inch in diameter. In the center is a broad, circular black band to aid in centering the spirit bubble. There is a good grip for the hand in center of rule 3½ inches long, the plumb openings having a 2-inch diameter, and the oval for bob 2¼ x 4 inches. Some of the advantages sought in the construction of this article in addition to those mentioned are moderate price, light weight and glasses clearly exposed, firmly set, but adjustable. The wood is cut on end for plumb cord and accurately grooved on each side as a center guide.



Mason's Plumb Rules or Levels.

Columbian Floor Spring Hinge.

The Columbian Hardware Company, Cleveland, Ohio, is offering the floor spring hinge shown in the accompanying illustrations. The box containing working parts, B, Fig. 1, which sets into the floor, is just the depth of a 1¾-inch double floor. This shallowness is advantageous, as if it is necessary to set the box over a joist or I-beam, no cutting into it is required. The box, while it necessitates cutting into the floor, is the width of a strip of flooring, and the working parts in it are covered and protected from dirt and moisture by a handsomely finished top plate, L, Fig. 1. The hinge operates through the action of a strong compression spring, whose tension may be adjusted by removing the top plate, it being unnecessary to remove hinge or door. The loose top pivot is another desirable feature of this hinge. By inserting a nail or thin tool in slot of top door part the top pivot, shown on the under part of the upper cut in Fig. 2, which is held in place by a spring, may be raised and the door released in an instant, without disturbing the hinge or its tension. Among other points of excellence the following are referred to: That the hinge is simple and compact; that the ball bearing feature contributes to its smooth, noiseless action; that it reduces the strain and jar on the door to a minimum; that any person can understand its workings and take it apart if necessary, and that it is easy to apply, and once applied it will give long and satisfactory service. The hinge is supplied in a variety of finishes and is described in the company's No. 18 catalogue, which will be mailed upon application.

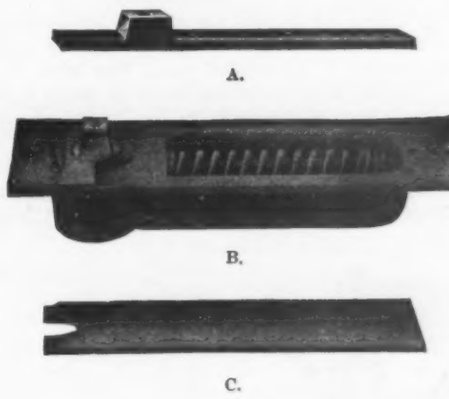


Fig. 1.—Columbian Floor Spring Hinge.

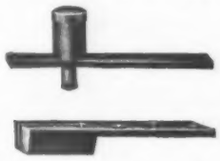


Fig. 2.—Loose Top Pivot of Floor Hinge.

Acme High Wheel Lawn Mower.

We illustrate herewith the Acme high wheel lawn mower, with ball bearing reel and roller bearing wheel. This is referred to as a strictly high grade mower, in which by the bearings friction has been reduced to a minimum. The wheels are 11 inches high, with rim driven gearing, and being of large diameter necessarily drive the cutting reel at a high speed, insuring a smooth cut lawn. The axles are fitted with roller bearings. The reel bearings have steel balls fitted in retainers running on hardened steel cones, which can be readily adjusted to take up the least possible wear. The cutter bar adjustment is simple and positive. Two screws, one on each side of the frame, are used for this purpose, held with permanent locking bolts on each end of the cutter bar. The cutter bar is hollow and ribbed, insuring rigidity and preventing it getting out of alignment. The lower knife is made of mild steel and has a crucible steel face welded on the cutting edge, the mild steel back being to prevent the cutting edge from cracking or splitting out. The cylinder blades are tampered and set for self sharpening. The cross handle has a simple mechanical fastening, making it rigid. Particular care is taken in the finish of the mower to make it rich and effective. The Acme mower is made by the American Die & Tool Company, Reading, Pa., and is furnished in 14, 16, 18 and 20 inch sizes.

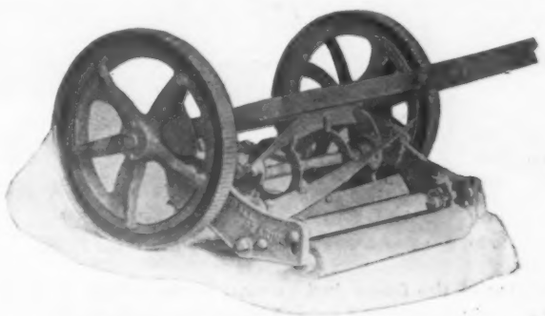


Fig. 1.—Acme High Wheel Lawn Mower.

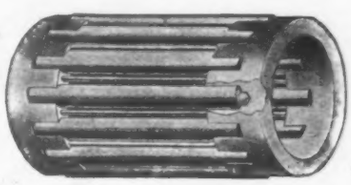


Fig. 2.—Mower Wheel Roller Bearing.

The Marlin Baby Repeating Rifle.

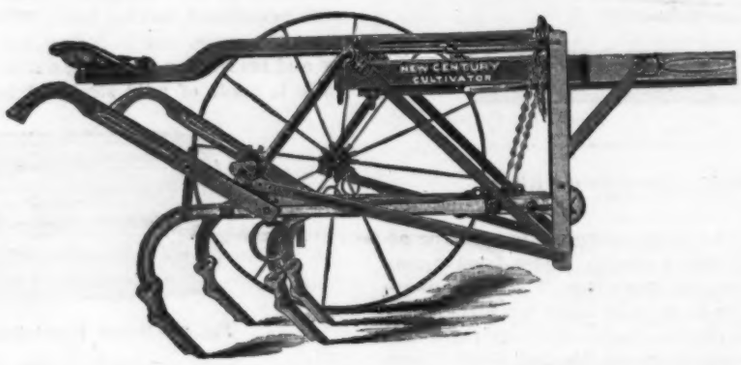
The Marlin Firearms Company, New Haven, Conn., is putting on the market the baby repeating rifle shown herewith, which is made with both round and octagon barrels. It is of first quality open hearth gun barrel steel with a tensile strength of from 60,000 to 80,000 pounds to the square inch. Every billet is thoroughly welded and hammered before rolling and each bar is finished by planishing. The boring, rifling, chambering and inside barrel finish are all up to the old Ballard standard, as made by the company for over 30 years. The frames are drop forged from best quality open hearth gun frame steel, each piece in the action being made from steel best suited for the work. As high carbon as possible is used to get hard contact points and to avoid trouble from the working parts wearing and getting out of adjustment; also to add to the life of the arm. The breech mechanism consists of two pieces, the breech bolt and the locking bolt. The locking bolt is pivoted in the breech bolt in such a manner that while the rear part of the locking bolt is up within the breech bolt while the action is open this portion of the locking bolt drops down against a section of the frame just as soon as the action is closed. The locking bolt and firing pin are so adjusted that it is impossible for the cartridge to be exploded by the firing pin until the cartridge is in the chamber and the action fully closed and locked. The action can be opened only when the firing pin is forward. The butt stocks and forearms are made of black walnut. The side plate takes off by unscrewing a thumb screw and allows instant removal of the action, so that both ends of the barrel are accessible for cleaning and inspection. The rifle is made on the solid top and side ejecting principle. The rifles are chambered to take both the 0.22 short and 0.22 long rifle cartridges, but the rifles as sent out will handle only the 0.22 short cartridges through the magazine and carrier. If the purchaser wishes to use the 0.22 long rifle cartridges he can get an extra carrier for the 0.22 long rifle cartridge only, which will interchange with the carrier for shorts. The carriers may be interchanged at will, without tools, and in a moment's time. The entire length of the rifle is 36 inches, with 20-inch barrel, and weighing about 3 pounds 10 ounces.

Fig. 1.—The Marlin Baby Repeating Rifle.

Fig. 2.—Breech Mechanism of Baby Repeating Rifle.

New Century Cultivator.

The cultivator shown in the accompanying cut is made one row, as illustrated, also two row, by Hancock Disc-Plow Company, Alton Ill. The cultivators are without levers, ratchets or springs. The weight of the operator on the rear end and the weight of the beams on the front end of the seat bars that pivot over the center of the axle, it is explained, secure a perfect balance of beams. For the different weight of the operator the chains that connect the front end of the seat bar to the beams are hooked back or forward, in holes in the beam provided for that purpose, until the beams are in perfect balance. This balance is obtained with weight of the operator from 50 to 300 pounds. A crossbar pivots in the center of the front end of the seat bar, to which chains from the beams are attached. This allows each beam independent balance, so that when one beam is raised it does not affect the other beam, but leaves the same perfect balance. The pole balance is obtained by moving the axle forward or backward, according to the weight of the operator and when once balanced it requires no changing, as the weight of the operator and the weight of the beams are at the same point over the center of the axle. It is remarked that the same balance of the pole is maintained whether the beams are up or down, or when one beam is raised to clear trash, so that when turning at the end of the rows the neck yoke is not thrown up under the horses' throats. When cross plowing or where the ground is rough the beams have no bouncing motion, it is pointed out. The hitch is low and close to the beam coupling so as to be in a direct line of draft from the shovels to the horses' shoulders, which, in addition to the advantage of draft, also keeps the cultivator from the sliding tendency on hillsides. The wheels are adjustable, in and out, to conform to the different widths between rows. The point is made that the cultivator is comparatively light and that on account of its simplicity and because it is constructed mostly from straight steel bars with few malleables and no castings it is strong and durable. The implement is made with wood or steel beams.



New Century Cultivator.

Yankee Notion Sleeve Board.

The sleeve board shown herewith is attached by a clamp and can be turned completely out of the way,

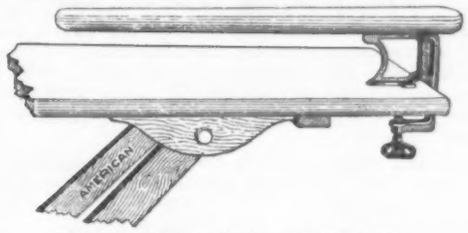


Fig. 1.—Yankee Notion Sleeve Board.

and when required can be as quickly replaced. The clamp and entire support is of malleable iron to avoid breakage and the thread on the screw is machine cut.

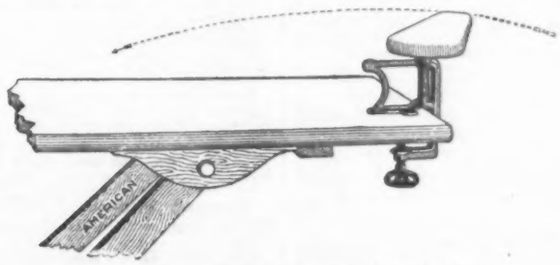


Fig. 2.—Sleeve Board Turned Out of the Way.

to work freely and smoothly. The board is offered by the American Mfg. & Novelty Company, Erie, Pa.

Autolyte Motor Car Lamp.

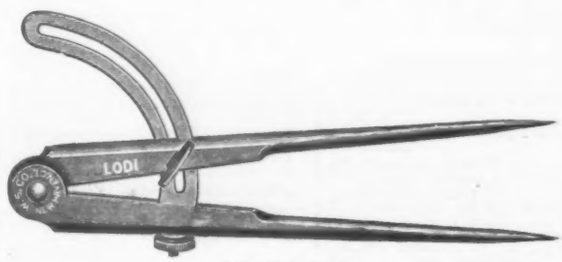
A. H. Funke, 83 Chambers street, New York, manufacturer of acetylene lamps, has added to a large line of automobile lamps the Autolyte, here illustrated. The approximate dimensions over all are—diameter of front, 10 inches; front to rear, 10½ inches, and hight, 10½ inches. The novel and distinguishing characteristic is the absence of a chimney, which greatly enhances the appearance of the lamp. The lamp can be furnished with either a parabolic lens in front or with Mangin mirror at back. Such accessory parts as handle, hinges, hinge pins, &c., are of heavy cast brass and made especially for the curves of this lamp and of proper proportion, making the entire construction handsome in appearance. The supply of acetylene gas from a separate generator is

Autolyte Motor Car Lamp.

supplied in the customary manner through a brass tube under the burner. The lamp itself is of polished brass.

Lodi Dividers.

The William Schollhorn Company, New Haven, Conn., is offering the dividers shown in the accompanying cut. They are made of sheet steel, with hardened points and



Lodi Dividers.

brass adjusting nuts. The goods are bright finish and are referred to as being made on a different principle from others on the market. They are offered at a low price and are made in 6, 8 and 10 inch sizes, the smaller size being packed one dozen in a box and other sizes half a dozen in a box.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal
Linseed, City, raw	41 @42
Linseed, City, Boiled	42 @43
Linseed, State and West'n, raw	40 @41
Linseed, raw Calcutta seed	@62
Lard, Extra Prime, Winter	64 @66
Lard, Extra No. 1	49 @52
Lard, No. 1	38 @40
Cotton-seed, Crude, f.o.b. mills	24½@25
Cotton-seed, Summer Yellow, Prime	32¼@32½
Cotton-seed, Summer Yellow, off grades	@..
Sperm, Crude	50 @52
Sperm, Natural Sprng	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	60 @62
Sperm, Bleached Winter	63 @65
Tallow, Prime	51 @53
Whale, Crude	@..
Whale, Natural Winter	42 @44
Whale, Bleached Winter	44 @46
Menhaden, Brown, Strained	23 @28
Menhaden, Light, Strained	24 @29
Menhaden, Bleached, Winter	30 @31
Menhaden, Ex.-Bld., Winter	31 @32
Menhaden, Southern	16 @16½
Cocoanut, Ceylon ℔ lb	6¼@ 6½
Cocoanut, Cochin ℔ lb	7⅛@ 7½
Cod, Domestic, Prime	34 @35
Cod, Newfoundland	38½@40
Red, Elaine	30 @31
Red, Saponified ℔ lb	4¼@ 4⅝
Olive, Italian, bbls	57 @62
Neatsfoot, prime	48 @49
Palm, Logos ℔ lb	6¼@..

Mineral Oils—

Black, 29 gravity, 25@30 cold test ℔ gal	10½@11¼
Black, 28 gravity, 15 cold test	11½@12½
Black, Summer	10¼@11¼
Cylinder, light filtered	18 @19
Cylinder, dark filtered	16 @17
Paraffine, 903-907 gravity	12½@13
Paraffine, 903 gravity	11½@12
Paraffine, 883 gravity	9¼@ 9¾
Paraffine, Red	11½@13

In small lots ¼¢ advance.

Miscellaneous—

Barytes:	
White, Foreign ℔ ton	$17.50@19.00
Amer, floated ℔ ton	18.00@19.00
Off color, No. 2 ℔ ton	15.50@16.00
Chalk, in bulk ℔ ton	3.50@ 3.75
Chalk, in bbls ℔ 100 lb	.. @ .40
China Clay, English ℔ ton	11.00@17.00
Cobalt, Oxide ℔ 100 lb	2.50@ 2.60
Whiting, Common ℔ 100 lb	.43@ .48
Whiting, Gilders ℔ 100 lb	.50@ .55
Whiting, Ex. Gilders ℔ 100 lb	.55@ .60

Putty, Commercial—℔ 100 lb

In bladders	$1.65 @1.85
In bbls. or tubs	1.15 @1.35
In 1 lb to 5 lb cans	2.60 @2.90
In 12½ to 50 lb cans	1.45 @1.85

Spirits Turpentine—℔ gal.

In Oil bbls	67 @67½
In machine bbls	67½@68

Glue—

	℔ lb
Cabinet	11 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	℔ lb
Bleached Commercial	38 @39
Bone Dried	48 @49
Button	40 @45
Diamond I	@55
Fine Orange	45 @47
A. C. Garnet	43 @45
D. C	60 @..
Octagon B	@52
T. N	42 @43
V. S. O	58 @..

Colors in Oil—

	℔ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	10 @15
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil	8½@ 9½
Lead, American white, in Oil:	
Lots of 500 lb or over	.. @ 7¼
Lots less than 500 lb	.. @ 7¾
In Barrels	.. @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price	.. @ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price	.. @ 1
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price	.. @ 1½

Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	℔ lb
Lead, White, Dry, in bbls	.. @ 6¾
Zinc, American, dry	4¾@ 5
Zinc, French:	
Paris, Red Seal, dry	9½
Paris, Green Seal, dry	10¾
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	12¾@13¾
Lots of less than 1 ton	13¼@13¾
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11¾@12¼
Lots of less than 1 ton	11¾@12¾

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb
Black, Carbon	5 @10
Black, Drop, American	4 @ 6
Black, Drop, English	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.50@3.60
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25

Lead, Red, bbls., ½ bbls. and kegs:

Lots 500 lb or over	.. @ 7¼
Lots less than 500 lb	.. @ 7¾
Litharge, American, bbls	.. @ 7¼
Ocher, American ℔ ton	$8.50@16.00
Ocher, American Golden	2½@ 3½
Ocher, French	1¼@ 2½
Ocher, Foreign Golden	3 @ 4
Orange Mineral, English	10 @12
Orange Mineral, French	10¾@12¼
Orange, Mineral, German	8½@10
Orange, Mineral, American	8½@ 8¾
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¾
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer. ℔ 100 lb	$0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital., Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Tale, French ℔ ton	$15.00@30.00
Tale, American ℔ ton	15.00@25.00
Terra Alba, French ℔ 100 lb	90 @1.00
Terra Alba, English ℔ 100 lb	90 @1.00
Terra Alba, American, ℔ 100 lb, No. 1	.70 @80
Terra Alba, American, ℔ 100 lb, No. 2	.60 @65
Umber, Turkey, Bnt. & Pow	2¼@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1¼@ 2
Umber, Raw, Amer	1¼@ 2
Yellow Chrome	11 @14
Vermilion, American Lead	10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@66
Vermilion, English, Import	75 @80
Vermilion, Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils.....℔ lb 6¾@7 ¢
Hay-Budden, Wrought.....8@8¼ ¢
Horseshoe brand, Wrought.....8@8¼ ¢
Trenton .....℔ lb 8@8¼ ¢

Imported—
Peter Wright & Sons.....℔ lb 10¼ ¢

Anvil, Vise and Drill—
Millers Falls Co., $16.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co.....33⅓%

Augers and Bits—
Com. Double Spur.....75@75&5%
Jennings' Pats., reg. finish.....50&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&5&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....10&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—
Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $15.....65%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—
Bonney Cut., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—
Ship Augers.....45&5@60%
Ford's .....33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered..gro.63¢@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights:
First Quality.....$6.75
Second Quality.....$6.25
Double Bit, base weights:
First Quality.....$9.00
Second Quality.....$8.50

Axle Grease—See *Grease, Axle*

Axles—Iron or Steel
Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style.....4¼¢
No. 2 Solid Collar.....4@4½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—
Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait—Fishing—
Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—
Caldwell new list.....50%
Pullman .....50&10@60%

Spring—
Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—
Steel Crowbars, 10 to 40 lb.... per lb., 3@3¼¢

Towel
No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—
Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—
Holt-Lyon Co.:
Holt, No. A, Japanned....℔ doz. $1.20
Holt, No. 1, Tinned.....℔ doz. $1.50
Holt, No. B, Japanned....℔ doz. $2.00
Holt, No. 2, Tinned.....℔ doz. $2.25
Lyon, No. 2, Japanned....℔ doz. $1.25
Lyon, No. 3, Japanned....℔ doz. $1.50
Taplin Mfg. Co.: ℔ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd.$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (R. M. W. Co.).℔ gro, net, $6.00

Bellows—
Blacksmith, Standard List.. 60&10@70&10%

Hand—
Inch..	*6*	*7*	*8*	*9*	*10*
Doz...	*$4.75*	*5.70*	*6.65*	*7.60*	*8.85*

Net Prices.

Molders—
Inch..	*9*	*10*	*11*	*12*	*14*
Doz...	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Bells—Cow—
Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—
Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—
Hand Bells, Polished, Brass.. 60&10@60&10 65%
White Metal.....60%
Nickel Plated.....50&10&60%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—
Farm Bells.....lb. 2¼¢
Steel Alloy Church and School 50&10@60%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting—Leather—
Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....50&5%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—
Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—
John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—
Common Wooden.....70&10@75%
Hartz St. Tackle Blocks.....50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—
Zinc, Crystal, &c...30&10@40&10%

Boards, Wash—See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co.....33⅓%

Bolts—
Carriage, Machine, &c.—
Common Carriage (cut thread): ⅜ x 6 and smaller.....75@—%
Larger and Longer..65&5@—%
Phila. Eagle, $3.00 list May 24, '99 80%
Bolt Ends, list Feb. 14, '95.... 65&10@—%
Machine, ⅜ x 4 and smaller 75@—%
Machine, larger and longer.. 65&5@—%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:
Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:
Inch.....	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:
Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square 66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Plow and Stove—
Plow .....65&10&10@70%
Stove .....87½&10@—

Tire—
Norway Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—
Borers Tap, Ring, with Handle:
Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*	*2½*		
Per doz.....	*$5.65*	*11.50*		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—
C. E. Jennings & Co.....30%
Langdon .....12&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—
Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—
Wrought Steel...80&10@80&10&5%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—
Price per dozen.
Quart.....	*10*	*12*	*14*
Water, Regular...	*1.40*	*1.70*	*1.90*
Water, Heavy....	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—
Hoosier.....℔ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts—Brass—
Wrought, list, Sept., '96..15@—%
Cast Brass, Tiebout's.....50%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—
Table and Back Flaps...75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts....55&10%

Ex. 10&10&10@10&10&10&5%

Cages, Bird—
Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%
Hendryx, Bronze:
700 series.....40&10%
Hendryx, Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—
Blunt, 1 prong.....per lb. 4¼¢
Sharp, 1 prong...per lb., 3½@4¾¢

Burke's Blunt....4@4¼¢
Burke's Sharp....4½@4¾¢
Gautier, Blunt....4@4¼¢
Gautier, Sharp....4½@4¾¢
Perkins', Blunt Toe....₱ lb 3.65¢
Perkins', Sharp Toe....₱ lb 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern	$1.35	1.85	2.05	each.
New York Pattern	1.50	2.20	2.45	each.
Baltimore Pattern	1.50	2.20	2.45	each.
Dubuque	1.35	1.60	1.75	each.

Cans, Oil—
Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	129.60 gro., net.

Caps, Percussion—
Eley's E. B....52@55¢
G. D....per M 34@35¢
F. L....per M 40@42¢
G. E....per M 48@50¢
Musket....per M 62@63¢

Primers—
Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M....20%
All other primers per M. $1.52@1.60

Cartridges—
Blank Cartridges:
32 C. F., $5.50....10&5%
38 C. F., $7.00....10&5%
22 cal, Rim, $1.50....10&5%
32 cal, Rim, $2.75....10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball....$1.49
Central Fire....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets. 15&10%
Rim Fire, Sporting....50%
Rim Fire, Military....15&5%

Casters—
Bed....70@70&10%
Plate....60&10@60&10&5%
Philadelphia....75@75&10%
Acme, Ball Bearing....33⅓%
Boss....70&10%
Boss Anti-Friction....70&10%
Gem (Roller Bearing)....80%
Martin's Patent (Phoenix)....45%
Standard Ball Bearing....45%
Tucker's Patent low list....30%
Yale (Double Wheel) low list....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—
American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$8.60	5.80	4.85	4.10	3.95	3.85	3.80
⅝	¾	⅞ to 1		1⅛ to 1¼ inch.		
$3.75	3.60	3.55		3.70		

German Coil....60&10&10@70%

Halter—
Halter Chains....60&5@60&10%
German Pattern Halter Chains, list July 2½, '97....60&10&10%
Covert Mfg. Co.
Halter....35&5%
Covert's Saddlery Works
Halter....70%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—
Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring. $24.50
6½—6-2, Str'ght, with ring. $25.50
6½—8-2, Str'ght, with ring. $29.50
6½—10-2, Str'ght, with ring. $34.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Eastern Standard Traces, Wagon Chain, &c....60&10%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron....60&10&5@70%
Brass....60&10@60&10&10%
Safety Chain....75@75&10%
Gal. Pump Chain....lb. 4@4½%
Covert Mfg. Co.:
Breast....35&5%
Heel....35&5%
Rein....35&5%
Stallion....35&5%
Covert Sad. Works:
Breast....70%
Hold Back....70%
Rein....70%
Oneida Community:
Am. Dog Leads and Kennel Chains, 40@40&5%
Niagara Dog Leads and Kennel Chains....45@60&5%
Wire Goods Co.:
Dog Chain....70&10%
Universal Dbl.-Jointed Chain....50%

Chain and Ribbon, Sash—
Oneida Community:
Copper Chain....60&5%
Steel Chain....60%
Pullman:
Bronze Chain....60%
Steel Chain....60&10%
Sash Chain Attachments, per set, 8¢
Aluminoy Sash Ribbon, per 100 ft....$1.25@$3.00
Sash Ribbon Attachments, per set, 8¢

Chalk—(From Jobbers.)
Carpenters' Blue....gro. 38@40¢
Carpenters' Red....gro. 35@35¢
Carpenters' White....gro. 28@30¢
See also Crayons.

Checks, Door—
Bardsley's....45%
Eclipse....60&10%
Pullman, per gro....$54.00
Russwin....40%

Chests, Tool—
American Tool Chest Co.:
Boy's Chests, with Tools....55%
Youths' Chests, with Tools....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools....20%
Machinists' and Pipe Fitters' Chests, Empty....50%
Tool Cabinets....50%
C. E. Jennings & Co.'s Machinists' Tool Chests....33⅓&10%

Chisels—
Socket Framing and Firmer
Standard List....75@75&10%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Socket Firmer No. 10....60%
C. E. Jennings & Co. Socket Framing No. 15....60%
Ohio Tool Co.'s....70%
Swan's....75%
L. & I. J. White....30@30&5%
L. & I. J. White, Tanged....25&5%

Tanged—
Tanged Firmers....33 1-3@40%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Nos. 191, 181....25%

Cold—lb.
Cold Chisels, good quality. 13@15¢
Cold Chisels, fair quality. 11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—
Almond Drill Chucks....35%
Almond Turret Six-Tool Chuck....35%
Beach Patent, each $5.00....35&5%
Empire....25%
Blacksmiths'....25%
Jacobs' Drill Chucks....35%
Pratt's Positive Drive....25%
Skinner Patent Chucks:
Independent Lathe Chucks....50%
Universal....50%
Combination....50%
Drill Chucks, New Model....30%
Drill Chucks, Standard....45%
Drill Chuck, Skinner Pat., all sizes. 35%
Drill Chucks, Positive Drive....30%
Planer Chucks....25%
Face Plate Jaws....40%
Standard Tool Co.:
Improved Drill Chuck....45%
Union Mfg. Co.:
Combination....50%
Czar Drill....35%
Combination, Geared Scroll....40%
Geared Scroll....40%
Independent....50%
Independent Steel....40%
Union Drill....45%
Universal....50%
Independent Iron F. Plate Jaws. 40%
Independent Steel F. Plate Jaws. 40%
Westcott Patent Chucks:
Lathe Chucks....50%
Little Giant Auxiliary Drill....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved....50%
Oneida Drill....50%
Scroll Combination Lathe....50%

Clamps—
Adjustable, Hammers'....20@20&5%
Cabinet, Sargent's....50&10%
Carriage Makers', P., S. & W. Co....40&10@50%
Carriage Makers', Sargent's....60%
Besly, Parallel....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co....40%
Wood Workers, Hammers'....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—
Iwan's Champion, Adjustable....55%
Iwan's Champion, Stationary....47%

Sidewalk—
Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—
Foster Bros....30%
New Haven Edge Tool Co.'s....45%
Fayette R. Plumb....33⅓@33⅓&10%
L. & I. J. White....30%

Clippers, Horse and Sheep—
Chicago Flexible Shaft Company:
'98 Chicago Horse, each....$8.75
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each. $15.00
Chicago Belt Horse, each. $20.00
Stewart's Enclosed Gear Horse, each....$6.75
Stewart's Patent Sheep Shearing Machine, each....$12.75
} 20%

Clips, Axle—
Regular Styles, list July 1, '05. 80%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—
Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks....75@75&2½%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—
Nickel Chain, Walter B. Stevens & Son's list....40%
Leather, Walter B. Stevens & Son's list....40%

Combs, Curry—
Metal Stamping Co....40%

Mane and Tail—
Covert's Saddlery Works....60&10%

Compasses, Dividers, &c.
Ordinary Goods....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers....65%
Calipers, Double....65%
Calipers, Inside or Outside....65%
Calipers, Wing....60%
Compasses....50%
Wm. Schollhorn Co.:
Excelsior Dividers....60%
Lodi Dividers....75%

Conductor Pipe,—
L. C. L. to Dealers:

Territory:	*Galvanized Galv. Steel.*	*Charcoal Iron.*	*Copper.*
Eastern:			
	70&12½%	*60&10%*	*50%*
Central:			
	70&5%	*60&2½%*	*40&10&5%*
Southern:			
	65&12½%	*50&15%*	*40&12½%*
So. Western			
	60&15%	*50&7%*	*40&10%*

Copper. 1¼&16 oz.
Eastern....50&10%
Central....50&7½%
Southern....50&5%
So. Western....50&2½%
Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador...	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.....	3	4	6	8	
Iceland, ea..	$1.80	$2.10	$2.40	$3.00	
Gal.....	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled....25%
Agate Lined....25%

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—
Soldering Coppers, 3 lbs. to pair and heavier, 23@24¢; lighter than 3 lbs. to pair....25@26¢

Cord—Sash—
Braided, Drab....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Cable Laid Italian.... lb., A, 18¢; B, 16¢
Common India....lb. 10@10½¢
Cotton Sash Cord, Tw'ted. 17@19¢
Patent Russia....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted. lb. 12@13¢
Anniston Cordage Co.: ₱ doz., 50 ft., Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ₱ lb, 24½¢; No. 7, 23½¢; Nos. 8 to 12, 23¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10....₱ lb 23 ¢
Peerless:
Cable Laid Italian....16 ¢
Cable Laid Russian....14 ¢
Cable Laid India....12 ¢
Braided India....18 ¢
Pullman:
Wire Sash Cord....10%
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton....₱ lb 40 ¢
Braided, Italian Hamp....₱ lb 40 ¢
Braided, Linen....₱ lb 55 ¢
Braided, White Cotton or Spot....₱ lb 35 ¢
Massachusetts, White....₱ lb 30 ¢
Massachusetts, Drab....₱ lb 35 ¢
Phoenix, White, Nos. 8 to 12, 27¢; No. 7, 27½¢; No. 6, 28½¢.
Silver Lake:
A quality, Drab....40 ¢
A quality, White....35 ¢
B quality, Drab....35 ¢
B quality, White....30 ¢
Italian Hemp....40 ¢
Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—
List Oct., '00....
85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—
Grain....40&12½%

Crayons—
White Round Crayons, gr. 6@6½¢
Cases, 100 gro., $5.00 at factory.
D. M. Steward Mfg. Co.:
Jumbo Crayons....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square....gr. $1.50
Rolling Mill Crayons....gr. $2.50
Railroad Crayons (composition) gr. $2.00
} Case lots, 20%
Zelnicker's Lumber:
Red, Blue, Green....₱ gro. $6.50
Black....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—
Fort Madison, Heavy....₱ doz. $7.00
Fort Madison, Light....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden....50%

Cutlery, Table—
International Silver Company:
No. 12 M'd'm Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor....₱ doz. $3.00
Wm. Rogers & Son....₱ doz. $2.50

Cutters—Glass—
H. H. Mayhew Co....40%
Red Devil....50%
Smith & Hemenway Co....50%
Woodward....40%

Meat and Food—
American....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's....₱ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal....40&10@50%
Little Giant....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers....25%
New Triumph No. 605, ₱ doz. $24.00.. 40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00....45&10&10%
Woodruff's....₱ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers....25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$32

Tobacco—
All Iron, Cheap..doz. $4.25@$4.50
Enterprise....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18....40%
Sargent's, ₱ doz., No. 2....60%
Sargent's, Nos. 12 and 21....60&10%

Washer—
Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger. 40&5%
Iwan's Vaughan Pattern Post Hole Augers....₱ doz. $6.25
Iwan's Perfection Post Hole Digger.. ₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers....₱ doz. $7.25
Kohler's Universal....₱ doz. $14.00
Kohler's Little Giant....₱ doz. $12.00
Kohler's Hercules....₱ doz. $10.00
Kohler's Invincible....₱ doz. $9.00
Kohler's Rival....₱ doz. $8.00
Kohler's Pioneer....₱ doz. $7.00
Never-Break Post Hole Diggers, ₱ doz., $24.00....60%
Samson, ₱ doz. $34.00....25%

Dividers—See *Compasses.*

Doors, Screen—
Phillips', style E, 7/8 in....₱ doz. $10.00
Phillips', style 077, 7/8 in....₱ doz. $7.50
Phillips', style x-y, 7/8 in....₱ doz. $10.50

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—
Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—
Common Blacksmiths' Drill, each....$1.50@$1.75
Breast, Millers Falls....15&10%
Breast, P., S. & W....40%
Goodell Automatic Drills. 40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3....16⅔%
Johnson's Drill Points....16⅔%
Millers Falls Automatic Drills. 33⅓&10%
Ratchet, Curtis & Curtis....25%
Ratchet, Parker's....40%
Ratchet, Weston's....40%
Ratchet, Weston's, Style H Improved....40%
Ratchet, No. 012....40%
Ratchet, Whitney's, P., S. & W. 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00....33⅓%

Twist Drills—
Bit Stock....60&10&10@70%
Taper and Straight Shank.... 60&10@60&10&5%

Drivers, Screw—
Screw D'ver Bits, per doz. 45@50¢
Falsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9....50%
Buck Bros.' Screw Driver Bits....30%
Champion....50%
Edson....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood....40%
Mayhew's Black Handle....40%
Mayhew's Monarch....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co....50&10%
Sargent & Co.'s:
Nos. 1 and 60....50&10&10%
Nos. 50, 53 and 55....60&10%
Nos. 20 and 40....70&10%
Smith & Hemenway Co....40&5%
H. D. Smith & Co.'s Perfect H'dle. 40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles....65%
No. 86....75%
Victor....55%
Defiance....70%
Swan's:
Nos. 7565 to 7568....50%
No. 7540....10&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized Galv. Steel.*	*Charcoal Iron.*	*Copper.*
Eastern:			
	80&5%	*70&10%*	*50%*
Central:			
	75&10&10%	*70&2½%*	*40&10&5%*
Southern:			
	75&12½%	*60&20%*	*40&12½%*
So. Western:			
	75&5%	*65&5%*	*40&10%*

Terms,—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—
Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Gauge....60&10%
No. 26....50%
No. 24....25%
No. 22....10%
Copper....50%

Elbows, Stove Pipe—
Dover, one piece....40%
Perfect Elbows (R. M. W. Co.)....40%

Emery, Turkish—

	¼ to ½	5½ to 220	Flour.
Kegs....lb.	*5¢*	*5¼¢*	*5½¢*
½ Kegs....lb.	*5¼¢*	*5¾¢*	*5¾¢*

¼ Keys.....lb. 5½¢ 6 ¢ 4 ¢
10-lb. cans, 10 in case....6½¢ 7 ¢ 6 ¢
10-lb. cans, less than 10.....10 ¢ 10 ¢ 8 ¢
Less quantity..10 ¢ 10 ¢ 8 ¢
NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Walling's .....40&10%

Cord and Weight—
Ives 40%

Faucets—
Cork Lined.....50@50&10%
Metallic Key, Leather Lined.. 60&10@70%
Red Cedar.....40&10@50%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass;
Burglar Proof, N. P.....25%
Improved, ⅞ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103.....$3.75
Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	15	17	19	21
Per doz	$3.25	3.75	4.25	4.75

P. S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's 70%
Stowell's Giant Grindstone Hanger.. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy .....50&10&10%
Stowell's Grindstone Fixtures, Light. 60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp .....$2.75 } 10&2½%
Cotton .....3.20 }
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15

Gates, Molasses and Oil—
Stebbins' Pattern.....80&10%

Gauges—
Marking, Mortise, &c..50&10@60%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....25%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P. S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.50; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush.. 25&10@50%
International Glue Co. (Martin's)..40%

Grease, Axle—
Common Grade....gro. $4.50@6.00
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb, $1.20; 2 lb, $2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each .....$6.00 }
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....$3.00

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&10@60&10&5%
Covert Mfg. Co.:
Web .....35&5%
Jute Rope.....50%
Sisal Rope.....30&10%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters.....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties 70%
Sisal Rope Ties.....60&10%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties 60%
Cotton Horse Ties.....80%
Livery Ties, Braided.....60%

Hammers—
Handled Hammers—
Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7½@33⅓&10&7½%
Engineers' and R. S. Hand.....50&7½&&50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—
Under 3 lb., per lb..50¢..80&5@—%
3 to 5 lb., per lb., 40¢..80&5@—%
Over 5 lb., per lb., 30¢, 80&10&5@—%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....45@50%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50%
D Handles.....50@50&5%

Cross-Cut Saw Handles—
Atkins' 40%
Champion .....45@45&10%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@$3.00
Brad Awl.....gro. $1.65@$1.75
Chisel Handles:
Apple Tanged Firmer, gro. assorted .....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted .....$2.15@$2.40
Apple Socket Firmer, gro. assorted .....$1.75@$1.95
Hickory Socket Firmer, gro. assorted .....$1.45@$1.60
Hickory Socket Framing, gro. assorted .....$1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel .....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle ℔ gro. $0.85@$1.50

Hangers—
NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, No. 1.....per doz. $3.00
Reliable, No. 2.....per doz. $2.00
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Currier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy.. No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.....60&5%
Hinged.....net $6.40
Covered .....60&22%
Special .....70&5%
Lawrence Bros.:
Advance .....60&10%
Cleveland 75%
Clipper, No. 75.....60%
Crown .....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant .....60&5%
Hummer .....70&5%
New York.....60&10%
Peerless 75%
Sterling .....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $13.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10,50&10%
Roller B'r'g St'l Track No. 12,$2.15
Roller B'r'g St'l Track No. 13,$2.30
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17.....$1.25
Trolley F. D. No. 120.....$2.10
Trolley F. D. No. 121.....$2.25
Trolley F. D. No. 150.....$2.35
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&10%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24.....$1.30
Trolley B. D. No. 27.....$1.40
Trolley B. D. No. 28.....$1.60
Roller Bearings Nos. 39, 41, 43 .....75%
Anti-friction No. 42.....60&20%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas 60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator 40%
Express 50%
Freight Car Door.....60%
Interstate .....60&10%
Lundy Parlor Door.....50&10%
Magic 60%
Matchless .....60&10%
Nansen .....70&5%
Parlor Door.....50&10%
Railroad .....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track...50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle 70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot 60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing..℔ doz. $5.00
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing...60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet 50%
Wilcox Auditorium Ball B'r'g.20%
Wilcox Barn Trolley No. 123..40%
Wilcox Elv. Door, Nos. 112 and 122½.....50%
Wilcox Elv. Door, No. 132.....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track.....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Wideman Narrow Gauge, Ball Bearing.....40%
For Track, see Rail.

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled.. $27.00
Victor Folding.....℔ gro. $9.00
Western, W. G. Co.....70&10%

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—
Regular list, first quality....50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.)

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 11 and 13..75&10%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5.....75&10&5%
Buffalo Gravity Lockir , Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L'Fchs.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch.....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch.....doz. ...@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

No.	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—
Holdback, Cast Iron...$6.50@$7.00
Non-Holdback, Cast Iron$5.25@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges 40%
Bommer Spring Hinges.....40%
No. 999 Wrot, Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge 50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Lawson Mfg. Co. Matchless.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Ball Bearing Floor Hinge....50%
Ohio Detachable Screen Door Hinge .....℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k.℔ gro. pr.$9

Extra 5@10% often given.

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges...70%
H vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's.70&10%
Hinge Hasps.....50%
Cor. Heavy Strap...75&5%
Cor. Ex. Heavy T.70&10%
} *Extra 10@10&5%*

Screw Hook and Strap. { *6 to 12 in..lb.3¾¢* / *14 to 20 in..lb.3½¢* / *22 to 36 in..lb.3¼¢*

Screw Hook and Eye:
¾ to 1 inch.....lb.6¼¢
⅝-inch.....lb.7½¢
½-inch.....lb.8½¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

	Per doz.			
Inch	*13*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.35*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons' Etc.—

Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6¼ in.....$3.35
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ℔ doz. $4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's.....45%
Empire.....50%
Pullman.....50%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.50; ℔ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List, Nos. 29, 32, 33, 129, 132, 133 and 135.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..70&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....75%
Czar.....65%
V Brace.....75%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree.....lb. 5¾@6¢
Hooks and Eyes:
Brass.....60&5@60&10&5%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 5 @ 6 ¢
3-ply Guaranteed..ft. 8 @ 9 ¢
4-ply Guaranteed..ft. 10 @11 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons—

Sad—

From ¼ t o 10.....lb.3 @3½¢
B. B. Sad Irons.....lb. 3¼@3½¢
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*68*	*65*	*78*	*75*
Tin'd Tops	*71*	*68*	*81*	*78*

New England Pressing.lb. 3¾@4¢

Pinking—

Pinking Irons.....doz.60¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%
Steel.....45%
Covert's Saddlery Works:
Dairy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....75@75&10%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz.$5.75@6.00
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—

Buffalo.....℔ gro. $13.00

Miscellaneous—

Farriers'.....doz. $3.00@3.25
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro.$1.25@$1.50
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz.$4.25@4.50
Lift Tubular, No. 0.....
doz.$4.75@5.00
Hinge Tubular, No. 0.....
doz.$4.75@5.00
Other Styles.....40@40&5%

Bull's Eye Police—

No. 1, 2¾-inch.....$2.75@3.00
No. 2, 3-inch.....$3.00@3.25

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.30
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co., Cotton and Hemp.45%

Lifters, Transom—

R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.25*	*2.00*	*1.75*
75 feet	*$1.75*	*1.35*	*1.10*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ cr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ℔ gro., $25.00; Gilt Edge, $23.00; Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.

Locks— Cabinet—

Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.

Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....50%

Padlocks—

Wrought Iron....75&10&5@80&10%
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....50%
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—

Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50.....2.75

Corking—

Reisinger Invincible Hand Power....
℔ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—

Chandler's.....12½%

Washing—

	Per doz.
Boss Washing Machine Co.:	
Boss No. 1	$57.00
Boss Rotary	$54.00
Champion Rotary Banner No. 1	$54.00
Standard Champion No. 1	$48.00
Standard Perfection	$36.00
Cint. Square Western	$30.00
Uneeda American, Round	$30.00

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.), new list.. 50&10%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria..50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest.....all sizes, $1.85@2.00
Cheap.....all sizes, $2.00@2.50
Better Grade..all sizes, $2.50@4.50

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M. S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—

Wire Nails and Brads, Papered. List July 20, 1899..85&5@85&10%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

	Nos.	*6*	*7*	*8*	*9*	*10*	
Ansonor		*23*	*21*	*20*	*19*	*18*	*...10&5%*
Champlain		*28*	*26*	*25*	*24*	*23*	*.....50%*
Coleman		*13*	*12*	*12*	*11*	*11*	*.....net*
New Haven		*23*	*21*	*20*	*19*	*18*	*...40&5%*
Putnam		*23*	*21*	*20*	*19*	*18*	*....33⅓%*
New Putnam		*19*	*18*	*17*	*16*	*16*	*..10&10%*
Western							*℔ lb 3½¢*

Jobbers' Special Brands.....
per lb .9@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head	*.. 1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, Blank or Tapped..$4.90
Hexagon, Blank or Tapped.$5.30
Square, Blank, C. & T.....$5.20
Hexagon, Blank, C. & T...$5.90
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....$5.30
Hexagon, Blank.....$5.20
Square, Tapped.....$5.20
Hexagon, Tapped.....$5.70

Oakum—

Best.....lb.6¼@6½¢
U. S. Navy.....lb.5¾@6¢
Navy.....lb.4½@5¢
Plumbers' Spun Oakum...2½@3¢
In carload lots ⅛¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10%
Tin or Steel.....65&10@70%
Zinc.....65&10@70%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13.....20%
Malleable, Hammers' Old Pattern, Nos. 1, 2 and 3.....50%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@71&10%
Railroad Oilers, &c.....60@63&10%

Openers— Can—

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....$1.75@$3.00
National.....50&10%
Stowell's Sprague.....℔ doz. 35@45¢
Vim Tin Shear and Can Opener, ℔ doz., 75c.; per gro., $7.50

Egg—

Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope.....lb.1¼@16¢

Rubber—

(Fair quality goods.)

Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '98, ℔ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—

R. M. W. Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co., ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.99	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos:	*lb.*	
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.6¢		287
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lbs., per 100 sq. ft.....8¢		23
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....10¢		

Per roll

Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll.....35@40¢
Medium weight, 30 lbs. to roll.....40@45¢
Heavy weight, 40 lbs. to roll..
46@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$15.00@50.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 300 sq. ft.), ton....
$32.50@35.50
2 ply, roll 108 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....75@85¢

Slater's Felt (roll 500 sq. ft.) .75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—

Flint Paper and Cloth .60@60&10%
Garnet Paper and Cloth 25%
Emery Paper and Cl'h .60@60&10%

Parers— Apple—

Advance ..... ℔ doz. $4.00
Baldwin ..... ℔ doz. $4.00
Bonanza Improved ..... each $6.50
Daisy ..... ℔ doz. $4.00
Dandy ..... each $7.50
Enterprise Improved ..... each $20.00
Family Bay State ..... ℔ doz. $15.00
Improved Bay State ..... ℔ doz. $36.00
Little Star ..... ℔ doz. $5.00
New Lightning ..... ℔ doz. $7.00
Reading 72 ..... ℔ doz. $3.25
Reading 78 ..... ℔ doz. $6.25
Rocking Table ..... ℔ doz. $6.20
Turn Table '98 ..... ℔ doz. $6.00
White Mountain ..... ℔ doz. $5.00

Potato—

Saratoga ..... ℔ doz. $7.00
White Mountain ..... ℔ doz. $6.00

Picks and Mattocks—

List Feb. 23, 1899 ..... 75%
Cronk's Handled Garden Mattock, ℔ doz., $6.40 ..... 33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass ..... .60@60&10%
Iron, list Nov. 11, '85 .. .60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in ..... .60%
Extra Heavy, 2-6 in ..... .70%
Fittings 75%

Pipe, Merchant—

Consumers, Carloads.

	Steel. Blk.	Galv.	Iron. Blk.	Galv.
⅛ & ¼ in..	71%	55%	68½%	52½%
⅜ & ½ in..	75%	63%	72½%	60½%
¾ to 6 in..	79%	69%	77 %	67 %
7 to 12 in..	74%	59%	72 %	56½%

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England ..... .68%
New York and New Jersey .71%
Maryland, Delaware, E. Pa. West. Pa. and West Va 77%
Virginia 76%
Ohio, Michigan and Ky 77%
Indiana 77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual ..... .40&10%
Bench, Second qual ..... .50&10%
Molding ..... 33⅓&10%
Bailey's (Stanley R. & L. Co.) 40%
Chapin-Stephens Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality .... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Toy and German ..... 10@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality .... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Adjustable Wood Bottom 60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.) 40%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) 35%
Ohio Tool Co.'s Iron Planes 60%
Sargent's ..... 60&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons ..... 25&10@30%
Buck Bros. 30%
Chapin-Stephens Co. ..... 30@30&10%
Ohio Tool Co. 30%
Stanley R. & L. Co. 35%
Union 50%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse ..... ℔ doz. $8.50

Plates—

Felloe ..... *lb.* 8¾@11¼¢
Self-Sealing Pie Plates (R. M. W. Co.) ℔ doz. $2.00 ..... 50%

Pliers and Nippers—

Button Pliers .... 75¢10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button ..... 75&10%
Cronk's 60%
Stub's Pattern 50%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers 50%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard 33⅓%
Elm City 33⅓%
Lodi 50%
Paragon 50%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10&10%
Chapin's Imp. Brass Cor. 10@40&10&10%
Pocket Levels ..... 30@30&10&10%
Disston's Plumbs and Levels 70%
Disston's Pocket Levels ..... 1+%
C. E. Jennings & Co.'s Iron 33⅓%
C. E. Jennings & Co.'s Iron, Adjustable ..... 40&7½%
Stanley R. & L. Co. 45%
Stanley's Duplex 35%
Woods' Extension 33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $3.00; No. 4, $12.00 ..... 50%

Points, Glaziers'—

Bulk and 1-lb. papers, lb. 8½@9 ¢
½-lb. papers ..... *lb.* 9 @9½¢
¼-lb. papers ..... *lb.* 9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye ..... ℔ doz. $3.25
Ft. Madison Western ..... ℔ doz. $4.00

Police Goods—

Manufacturers' Lists ... 25@25&5%
Tower's 25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ℔ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ℔ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $0.72 .... 40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ⅛ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can ..... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr, $4.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail ..... each 70¢
Black Silk, ½ lb box ..... ℔ doz. $1.00
Black Silk, 5 oz. box ..... ℔ doz. $0.75
Black Silk, ½ pt. liq ..... ℔ doz. $1.00

Poppers, Corn—

1 qt., Square ..... *gro.* $9.00
1 qt., Round ..... *gro.* $10.00
1½ qt., Square ..... *gro.* $11.00
2 qt., Square ..... *gro.* $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb ..... *each* 45¢
Fine Sporting, 1 lb .... *each* 75¢
Rifle, ½-lb ..... *each* 15¢
Rifle, 1-lb ..... *each* 25¢
In Kegs:
12½-lb. kegs $3.50
25-lb. kegs $4.50
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun ..... 50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. ..... 20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00 ..... 50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller $21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00 ..... 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
Pelican, ℔ doz. $9.00 ..... 40&10%
Scranton, Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots ..... ℔ doz. $6.00
Diamond B, No. 3, case lots ..... ℔ doz. $5.50
Giant No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15 ..... 33⅓%
Staple Pullers 60%
Parrot Tack and Stub Puller, ℔ doz., 75c.; ℔ gro., $6.00

Pulleys, Single Wheel—

Inch	1¼	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	.75	1.05
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55					
Inch	2	2¼	2½		
Hot House, doz.	$0.65	.85	1.20		
Inch	1¼	1½	1¾	2	
Screw, doz.	$0.16	.19	.23	.30	
Inch	1¾	2	2¼	2½	
Side, doz.	$0.25	.40	.55	.60	
Inch	1½	1¾	2	2½	

Stowell's:
Ceiling or End, Anti-Friction .. 60&10%
Dumb Waiter, Anti-Friction .. 60&10%
Electric Light 60%
Side, Anti-Friction ..... 60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in ..... .16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in .. .16@19¢
Acme ..... 1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless .. 50%
Ideal ..... 70&10%
Niagara ..... 1¾ in., 16¢; 2 in., 19¢
No. 26, Troy .. 1¾ in., 14½¢; 2 in., 16½¢
Star ..... 1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern ..... .60@60&10%
Pitcher Spout ..... .80@80&10%
Wood Pumps, Tubing, &c .45@50%
Barnes Dbl. Acting (low list) 50%
Barnes' Pitcher Spout ..... 75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list) 55%
Flint & Walling's Fast Mail (low list) ..... 55&5%
Flint & Walling's Tight Top Pitcher .80%
National Specialty Mfg. Co., Measuring, $6.00 ..... 30%
Mechanical Sprayer $6.00
Myers' Pumps (low list) 50%
Myers' Power Pumps 50%
Myers' Spray Pumps ..... 50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	4
	$3.30	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—

Saddlers' or Drive, good ..... *doz.* 50@75¢
Spring, single tube, good quality ..... $1.75@2.00
Revolving (4 tubes) ..... *doz.* $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive .50%
Bemis & Call Co.'s Check 55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Wm. Schollhorn Co.:
Bernard 33⅓%
Lodi 50%
Paragon 50%
Steel Screw, B. & K. Mfg. Co. 50%
Tinners' Hollow, P., S. & W. Co. .. 40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.41 ..... 60%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron ..... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ 30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail.. ℔ ft. 2¾¢
O. N. T. Rail ..... 2½¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T., ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in. ..... ℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢ .. 50%
None Better ..... ℔ ft. 3¾¢
Standard ..... ℔ ft. 4 ¢
Myers' Stayon Track ..... 60&10%
Richards' Mfg. Co.:
Common 1 x 3-6 in., $2.25; 1¼ x 3-16, $2.50; 1¼ x 3-16, $2.75.
Special Hinged Hanger Rail .. 60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢
Safety Door Hanger Co.'s Storm King Safety 60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail ..... ℔ ft. 1¾¢
Steel Rail, Plain 25%
Wrought Bracket, 1 3-16 in.... ℔ ft. 3¢
Wrought Bracket, 1½ x 5-16.. ℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢ 60%
P. L. B. Steel Rail ..... ℔ 100 ft. $3.00
No. 0, 1 x 3-16 ..... ℔ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn $2.70
Jackson Lawn, 29 and 30 teeth, doz., net $4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.. 75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00 ..... 80%
Queen City Lawn, ℔ doz., 29 teeth, $3.45; 24, $3.60 ..... net.
Anticlog Lawn, ℔ doz. $4.00
Malleable Garden ..... 70&10%
Kohler's:
Lawn Queen, 20-tooth ..... ℔ doz. $3.45
Lawn Queen, 24-tooth ..... ℔ doz. $3.60
Paragon, 20-tooth ..... ℔ doz. $2.75
Paragon, 24-tooth ..... ℔ doz. $3.00
Steel Garden, 14-tooth .... ℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden ..... 75&5%

Rasps, Horse—

Disston's 75%
Heller Bros. ..... 70&5@70&10&5%
McCaffrey's American St'd .. 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—

Boras—I C. 60%
Fox Razors, No. 42.. ℔ doz. $20.00
Fox Razors, No. 44.. ℔ doz. $20.00
Fox Razors, No. 82, Platina... ℔ doz. $25.00
Red Devil 50%
Silberstein:
Carbo Magnetic $18.00
Griffon, No. 65 ..... $15.00
Griffon, No. 60 ..... $12.00
All other Razors 40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¾, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze. 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P 33⅓%
2904 PN 33⅓%
0924 N 33⅓%
02084 N 33⅓%
002904 PN 33⅓%
802 N 33⅓%
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN .33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed ..... .70&10%

Revolvers—

Single Action ..... .95¢@$1.00
Double Action, except 44 cal .$1.85
Double Action, 44 caliber $2.00
Automatic $3.45
Hammerless $4.00

Riddles, Hardware Grade

16 in ..... *per doz.* $2.25@$2.50
17 in ..... *per doz.* $2.50@$2.75
18 in ..... *per doz.* $2.75@$3.00

Rings and Ringers—

Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.00	1.15	1.40 doz.

Rea's Improved Self-Piercing, Copper 2 in., ℔ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes .$4.00@4.50
Hill's Ringers, Gray Iron ..... *doz.* 50@55¢
Hill's Ringers, Malleable Iron .. *doz.* 70@75¢
Blair's Rings ... *per gro.* $4.75@5.25
Blair's Ringers. per doz. $0.60@ .65
Brown's Rings .. *per gro.* $5.00@5.50
Brown's Ringers. per doz. $0.60@ .65

Rivets and Burrs—

Copper 45%
Iron or Steel ..... 75@75&5%

Bifurcated and Tubular—

Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—

Acme, Stowell's Anti-Friction 50%
Barn Door, Sargent's list 60%
Cronk's Stay No. 65, $0.90; No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56 ..... $0.84
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53 .75¢
O. K. Adj. and Reversible No. 58 .50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%
Stowell's Barn Door Stay.. ℔ doz. $1.00
Swett's Anti-Friction 50%
Screw and Spike Stay.... ℔ doz. 65¢
Hinge Adjustable Stay..... ℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger: Pure ..... *lb.*, 12½¢
Sisal, 7-16 in. diam. and larger: Pure ..... *lb.*, 10¢
Sisal, 7-16 in. diam. and larger: No. 2 quality ..... *lb.* 8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed ..... *lb.*, 8¢
Pure ..... *lb.* 10¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed ..... *lb.* 8¢
Pure ..... *lb.* 10¢
Cotton Rope: Best, ¼-in. and larger. 16½@18¢
Medium, ¼-in. and larger. 15½@16½¢
Common, ¼-in. and larger.. 10¢ In coils, ½¢ advance.
Jute Rope: Thread No. 1, ¼-in. & up, lb. 6¼¢
Thread No. 2, ¼-in. & up, lb. 5¾¢
Old Colony Manila Transmission Rope ..... ℔ lb 17½¢

Wire Rope—

Galvanized ..... .37½&2½%
Plain ..... .45&2½%

Ropes, Hammocks—
Covert Mfg. Co.:
Jute 50%
Sisal ..... 30&10%
Covert Saddlery Works ..... 60&5%

Rulers, Desk—
Stimpson & Son:
Boxwood and Maple ..... 30&10%

Rules—
Boxwood ..... *60&10&10%*
Ivory ..... *35&10@35&10&5%*
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Flexifold ..... 27½&10&10&2½%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag 40%
Zig Zag, Pin Joint 42½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band ..... 50&10@60
Cross Cuts ..... 35&5%
Mulay, Mill and Drag 50%
One-Man Saw 40%
Wood Saws 40%
Hand, Compass, &c 40%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 14 in. wide 60%
Band, ⅛ to 1¼ 60%
Crosscuts 50%
Narrow Crosscuts 55%
Mulay, Mill and Drag 50%
Framed Woodsaws 35%
Woodsaw Blades 35%
Woodsaw Rods 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Butcher Saws and Blades 35%
C. E. Jennings & Co.'s:
Back Saws 25%
Butcher Saws 30%
Compass and Key Hole Saws ..... 35&5%
Framed Wood Saws 30%
Hand Saws ..... 20&2½%
Wood Saw Blades 35%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 50%
Crescent Ground Cross Cut Saws 35%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 50%
Band Saws 50%
Back Saws ..... 25@25&1½%
Butcher Saws ..... 35@35&1½%
Hand Saws ..... 25@25&1½%
Hand Saws, Bay State Brand 42½%
Compass, Key Hole, &c ..... 25@25&1½%
Wood Saws ..... 35@35&1½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws ..... 40&10@50%
Butcher Saws Blades ..... 35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saws—
Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Keystone 40%
Hack Saw Frames 30%
Fitchburg File Works, The Best 35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete ..... 40&7½%
Goodell's Hack Saw Blades 40%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades 35%
Diamond Hack Saw Frames 50%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 25%
Victor Hack Saw Frames 40%

Scroll—
Barnes' No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 25%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $4.00 ..... 15&10%

Scalers, Fish—
Covert's Saddlery Works ..... 60&10%

Scales—
Family, Turnbull's ..... *50@50&10%*
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... *doz. $5.50*
Two Platforms, ½ oz. to 8 lbs. ..... *doz. $16.00*
Union Platform, Plain ..... *$1.70@1.90*
Union Platform, Stpd. ..... *$1.85@2.15*
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
Chicago Scale Co.:
The "Little Detective" ..... 25 lbs 50%
Union or Family No. 2 ..... 60%
Portable Platform (reduced list) 50%
Wagon or Stock (reduced list) ..... 25@35%
"The Standard" Portables 50%
"The Standard" R. R. and Wagon 50%

Scrapers—
Box, 1 Handle ..... *doz. $2.00@2.25*
Box, 2 Handle ..... *doz. $2.60@2.85*
Ship ..... *Light, $2.00; Heavy, $1.50*
Adjustable Box Scraper (S. R. & L. Co.), $6.00 ..... 45%
Chapin-Stephens Co., Box ..... 30@30&10&10%

Screens, Window and Frames—
Air Line Pattern Screens ..... 60&10%
Flyer Pattern Screens ..... 60&10@60&10&5%
Maine Screen Frames ..... 40&10&5%
Perfection Screens ..... 60&10@60&10&5%
Phillips' Screen Frames ..... 60&5@60&10%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1½, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech, doz. ..... *30@30&5%*
Hand, Wood ..... *30@30&5%*
R. Bliss Mfg. Co., Hand ..... 30@30&10%
Chapin-Stephens Co., Hand ..... 30@30&10%
Ohio Tool Co., Bench and Hand 30%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 ..... *75&15%*
Coach, Gimlet Point, list Oct. 1, '99 ..... *75&10%*
Hand Rail, list Jan. 1, '81 ..... *70&10@75%*

Jack Screws—
Standard List ..... *80@80&5%*
Millers Falls ..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P., S. & W. 50%
Sargent ..... 70&10%
Swett Iron Works ..... 75&10@80&5%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron ..... *50@50&10%*
Flat or Round Head, Brass ..... *50@50&10%*

Set and Cap—
Set (Iron) *80%*
Set (Steel), net advance over Iron *25%*
Sq. Hd. Cap *75%*
Hex. Hd. Cap *75%*
Rd. Hd. Cap ..... *60&10%*
Fillister Hd. Cap ..... *60&10&10%*

Wood—
List July 23, 1903.
Flat Head, Iron ..... *87½&10@..%*
Round Head, Iron ..... *85 &10@..%*
Flat Head, Brass ..... *85 &10@..%*
Round Head, Brass ..... *80 &10@..%*
Flat Head, Bronze ..... *77½&10@..%*
Round Head, Bronze ..... *75 &10@..%*
Drive Screws ..... *87½&10%*

Scroll Saws—
See *Saws, Scroll.*

Scythes—
	Per doz.
Grass, No. 1, Plain Finish	*$6.25*
Clipper, Bronzed Webb	*$6.50*
No. 3 Clipper, Pol'd Webb	*$6.75*
No. 6 Clipper & Solid Steel	*$7.00*
Bush, Weed & Bramble, No. 2	*$6.50*
Grain, No. 1	*$8.25*
Bronzed Webb, No. 1	*$8.50*
Nos. 3 & 4 Clipper, Grain	*$8.75*
Solid Steel No. 6	*$9.25*

Seeders, Raisin—
Enterprise ..... 25@30%

Sets— Awl and Tool—
Aiken's Sets, Awl and Tools:
No. 20, ℔ doz., $10.00 ..... 60&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Sets, Nail—
Octagon ..... *gro. $3.50@3.75*
Buck Bros 27½%
Cannon's Diamond Point, ℔ gro. $12.40%
Mayhew's ..... ℔ gro. $9.00
Snell's Cor'gated, Cup Pt ..... ℔ gro. $7.20
Snell's Knuried, Cup Pt ..... ℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—
Regular list ..... *75@75&10%*

Saw—
Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut 30%
Plate 20%
Disston's Star and Monarch 25%
Morrill's No. 1, $15.00 ..... 50%
Nos. 3 and 4, Cross Cut, $20.00 ..... 50%
No. 5, Mill, $30.00 ..... 50%
Nos. 10, 11, 95, $15.00 ..... 50%
No. 1 Old Style, $10.00 ..... 50%
Special, $16.25 ..... 50%
Giant Royal Cross Cut ..... ℔ doz. $8.00
Royal, Hand ..... ℔ doz. $4.50
Taintor Positive ..... ℔ doz. $6.75

Shaving—
Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co 70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz $1.50
Mounted Kitchen Sand Stone, ℔ doz $1.50
Natural Grit Carving Knife Hones, ℔ doz $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz $1.50
Quick Edge Pocket Knife Hones, ℔ doz $2.50
} 40%

Skate—
Smith & Hemenway Co 20%

Shaves, Spoke—
Iron ..... *doz. $1.10@1.25*
Wood ..... *doz. $1.75@2.25*
Bailey's (Stanley R. & L. Co.) 45%
Razor Edge (Stanley R. & L. Co.) 35%
Chapin-Stephens Co ..... 30@30&10&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%
Wood's F1 and F2 ..... 50%

Shears—
	Cast Iron	7	8	9 in.	
Best		*$16.00*	*18.00*	*20.00*	*gro.*
Good		*$13.00*	*15.00*	*17.00*	*gro.*
Cheap		*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap ..... *70@70&10%*
Best quality, Nickel ..... *60@60&10%*
Fair quality, Jap ..... *80@80&5%*
Fair quality, Nickel ..... *75@7"&10%*
Tailors' Shears ..... *40@40&10%*
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson's Sheep, 1900 list ..... 50&10%

Tinners' Snips—
Steel Blades ..... *20&5@20&10%*
Steel Laid Blades ..... *40&10@50%*
Forged Handles, Steel Blades, Berlin ..... 50@50&5%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in 50%
Niagara Snips 40%
P., S. & W. Forged Handles 20%

Pruning Shears—
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades ..... 50&10%
P. S. & W. Co 33⅓%
Wilkinson's Hedge, 1900 list ..... 50&10%
Wilkinson's Lawn and Border 50%

Sheaves—Sliding Door—
Stowell's Anti-Friction 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 40%
R. & E. list 33⅓%
Wrightsville Hatfield Pattern 80%

Sliding Shutter—
Reading list 40%
R. & E. list 33⅓%
Sargent's list ..... 10&10%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge ..... 65&10%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge ..... 25&10%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge ..... 20&5%
Climax, Union, League, New Rival, 10 and 12 gauge ..... 25&5%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ..... 20&5%
Expert, Metal Lined and Pigeon, 10 12, 16 and 20 gauge ..... 33⅓&5%
Robin Hood, Low Brass ..... 20&10%
Robin Hood, High Brass ..... 30&10%

Shells, Loaded—
Loaded with Black Powder *40%*
Loaded with Smokeless Powder, medium grade ..... *40&5%*
Loaded with Smokeless Powder, high grade ..... *40&10&10%*
Robin Hood Smokeless Powder:
Robin Hood, Low Brass 50%
Comets, High Brass ..... 50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... per keg *$4.00*
Steel ..... per keg *$3.75*
Burden's, all sizes ..... ℔ keg $3.90

Shot—
Drop, up to B, 25-lb. bag *$1.80*
Drop, B and larger ..... *per 25-lb. bag, $2.05*
Buck, 25-lb. bag *$2.05*
Chilled, 25-lb. bag *$2.05*

Shovels and Spades—
Association List, Nov. 15, 1902 ..... *40%*

Snow Shovels—
Long Handle ..... *$2.75@3.00*
Wood and Mall. D. Handle ..... *$3.25@3.50*

Sieves and Sifters—
Hunter's Imitation ..... *gro. $9.50@10.00*
Hunter's Genuine ..... *per gro. $12.00@12.50*
Buffalo Metallic Blued, S. S, Co., ℔ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ℔ doz. $2.00 ..... 20%

Sieves, Seamless Metallic—
	Per dozen.			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... *doz. $0.90@0.95*
Mesh 20, Nested ..... *doz. $1.00@1.05*
Mesh 24, Nested ..... *doz. $1.30@1.40*

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in ..... *60&5%*
20 x 30 to 24 x 50 in *55%*
24 x 60 to 24 x 120 in *35%*
Barnes' low list:
Up to and including 20 x 36 in 60%
20 x 40 to 24 x 50 in 55%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron ..... *80@80&10%*
Steel ..... *40@40&10%*

Slates, School—
Factory Shipments.
"D" Slates ..... *50@50&10%*
Eureka, Unexcelled Noiseless ..... *60&5 tens*
Victor A, Noiseless ..... *60&5 tens &5%*

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... *40@40&10%*
Covert Mfg. Co.:
Derby ..... 30&2%
High Grade 45%
Jockey 35%
Trojan 45%
Yankee ..... 30&2%
Yankee Roller ..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Harness Snaps, 1 inch ..... 60&5%
Swivel Snaps 60%
Swivels 50%
Sargent's Patent Guarded ..... 66⅔&10%

Snaths—
Scythe *50%*

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality ..... *50&10@60&5%*
Cheap ..... *60@60&10%*
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous—
German Silver ..... *60@60&5%*
Cattaraugus Cutlery Co.:
Seneca Silver 50%

Tinned Iron—
Teas ..... *per gro. 45@50¢*
Tables ..... *per gro. $0.50@$1.00*

Springs— Door—
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 25%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 30 in ..... ℔ doz. $1.10
Victor (Coil) ..... 50&10&10%

Carriage, Wagon, &c.—
	1¼ in. and Wider:	*Per lb*
Black		*4@4¼¢*
Half Bright		*4@4¼¢*
Bright		*4½@4¾¢*

Painted Seat Springs:
1½ x 2 x 26 ..... *per pr. 42¢*
1½ x 3 x 28 ..... *per pr. 70¢*

Sprinklers, Lawn—
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24 ..... 30%
Pleuger & Henger Mfg. Co.:
Cactus 70%
Japanese 75%
Nationals 65%

Squares—
Nickel plated } *List Jan. 5, 1900.*
Steel and Iron } *75&5@75&10%*
Rosewood Hdl. Try Square and T-Bevels ..... *60&10&10@70%*
Iron Hdl. Try Squares and T-Bevels ..... *40&10@40&10&10%*
Disston's Try Sq., and T-Bevels 70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2 ..... 50%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz. $1.00*
Good Grade ..... *doz. $1.25*
Tinned Iron ..... *doz. $0.75@1.25*
Iron, Porcelain Lined ..... *doz. $1.75*

Staples—
Barbed Blind ..... *lb. 6@6½¢*
Electricians', Association list ..... *80&10&10%*
Fence Staples, Plain, $2.25; Galvanized *$2.55*
Poultry Netting Staples ..... *per lb. 3¼@3½¢*
Grand Crossing Tack Co.'s list ..... 80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros 30%
C. & A. Hoffmann's 10%

Steelyards— ..... 30@30&10%

Stocks and Dies—
Blacksmiths' ..... *50@50&10%*
Curtis Rev'ble Ratchet Die Stock 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—
Enterprise ..... 25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit 60%
Gem Corundum Axe, Single or Double Grit 60%
Gem Corundum Slips 60%
Gem Corundum Razor Hones 50%
Pike Mfg. Co., 1904 list: ℔ lb.
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 30¢
Lily White Slips ..... 90¢
} 35%

Rosy Red Slips.....80¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....
India Oil Stones (entire list).....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%
Hindostan No. 1, R'g'lar.₱ lb 8¢
Hindostan No. 1, Small..₱ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, Extra, 5 to 8 in.....₱ lb 80¢
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips.....40¢
Sand Stone.....6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ₱ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots.....₱ gro. $9.00
One gross or more.....₱ gro. ..00
Lots of 10 gross or more..₱ gro. 90.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S..₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S.₱ gro. $9.00
Green Mountain S. S..₱ gro. $6.00
Extra Indian Pond S.S.₱ gro. $7.50
No. 1 Indian Pond S.S.₱ gro. $7.00
No. 2 Indian Pond S.S.₱ gro. $4.50
Leader Red End S. S.₱ gro. $4.50
Quick Cut Emery....₱ gro. $10.00
Pure Corundum.....₱ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%.
} 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots.....25&20%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket.....doz. $1.80
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902.....30&5%

Sweepers, Carpet—

National Sweeper Co.. ₱ doz.
Louis XV, Roller Bearing, Gold Plated.....$120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled.....$25.00
Triple Medal, Roller Bearing, Nickeled.....$24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled.....$21.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in. case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire.....₱ doz $25.00
Model A, Sterling.....₱ doz. $25.00
Model B, Sterling, Nickeled.....₱ doz. $23.00
Model B, Sterling, Japanned.....₱ doz. $21.00
Model C, Sterling.....₱ doz. $21.50
Model D, Sterling.....₱ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks..90@37½&10%
American Cut Tacks....90@37½&10%
Swedes Cut Tacks.....90@37½&10%
Swedes Upholsterers' Tacks... 90&50%
Gimp Tacks.....90&50%
Lace Tacks.....90&50%
Trimmers' Tacks.....90@37½&10%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&50%
Hungarian Nails.....85%
Finishing Nails.....70%
Trunk and Clout Nails....80&5%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50&10@60%
See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, R. M. W. Co....30-gal.	$3 40
Emerald, R. M. W. Co....60-gal.	$4.25
Queen City, R. M. W. Co...30-gal.	$3.65
Queen City, R. M. W. Co...60-gal.	$4.50

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel ..... $3 1-3&5%
Chesterman's .....25@25&5%
Eddy Asses' Skin.....40&10@50%
Eddy Patent Leather.....25@30&5%
Eddy Steel.....40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather.....25&5@25&10%
Metallic and Steel, lower list.....35@35&5%
Pocket .....35@35&5%
Lufkin's.
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@33⅓%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers.....50%
Stowell's Hay Forks.....50%
Stowell's Fork Pulleys.....50%

Miniature—

Smith & Hemenway Co.'s.....25%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75@75&5%
Newhouse .....45@45&5%
Hawley & Norton.....65%
Victor .....70&10%
Oneida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ₱ doz. $13.25
No. 3, Rat, ₱ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ₱ doz. $5.25; case of 72 ₱ gro. $4.70 doz.
No. 4, Mouse, ₱ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ₱ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, 5 in. ₱ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ₱ gro. $6.00
Never-Break Steel Garden Trowels.. ₱ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....₱ doz. $16.00
Grocery .....₱ doz. $15.00
Daisy Stove Trucks, Improved Pattern .....₱ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....₱ doz. $18.50

Tubs, Wash—No. 1 2 3

Galvanized, per doz. $4.25 4.75 5.25
Galvanized Wash Tubs (R. M. W. Co.):
No. 1 2 3 10 20 30
Per doz., net.$5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine:	BC.	B.
No. 9, ¼ and ½-lb. Balls	*22@24¢*	
No. 12, ¼ and ½-lb. Balls	*18@20¢*	
No. 18, ¼ and ½-lb. Balls	*16@18¢*	
No. 24, ¼ and ½-lb. Balls	*16@18¢*	
No. 36, ¼ and ½-lb. Balls	*15@17¢*	
Chalk Line, Cotton ½-lb. Balls	*25@30¢*	

Cotton Mops, 6, 9, 12 and 15 lb. to doz.....10@18¢
Cotton Wrapping, 5 Balls to lb., acording to quality...1½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....13@14¢
American 3-Ply Hemp, 1-lb. Balls .....13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....8½¢
India 3-Ply Hemp, 1-lb. Balls..8½¢
India 3-Ply Hemp, 1½-lb. Balls. 7@8¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls .....9@10¢
Mason Line, Linen, ½-lb. Bls..46¢
No. 26½ Mattress, ¼ and ½-lb. Balls .....37¢
Wool, 3 to 6 ply....B 6¢; A 6½¢

Vises—

Solid Box.....60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting.....25@25&5%
Tiger Machinists'.....40%
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&5@70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch 50%
Solid Jaw.....50%
Merrill's 20%
Millers Falls.....60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip.....20%
Parker's:
Victor .....20@25%
Regulars .....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Sargent's 40%
Snediker's X. L.....33⅓%
Stephens' 33⅓%
Williamson Mfg Co. Double Swivel..40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz. $30.....25%
Perfection Saw Clamps, ₱ doz.....$4 50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip.....15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise .....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%
Williamson Mfg. Co. Double Swivel Combination Pipe.....40&5%

Wads—*Price per M.*

B. E., 11 up	*60¢*
B. E., 9 and 10	*70¢*
B. E., 8	*80¢*
B. E., 7	*80¢*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*

Dis. 15%

Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 55%
Ground 60%
Plain or Unground.....65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware:
Maslin Kettles.....70%
Covered Wares
Tinned and Turned.....40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each.....	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅛ 1 1½ 1¼ inch.
10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ...$5.70 4.80 3.50 3.30 3.10
The above prices are based on 5.70¢ off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish.....lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co.....40&2%
Covert's Saddlery Works.....60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District...$27.50@$28.00
Southern Territory.$20.00@$23.00
Western and Central Districts .....$23.00@$25.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80%
10 to 18.....80&2½%
19 to 26.....80&7½%
27 to 36.....80&2½%
Galvanized:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 16.....72½&10&2½%
19 to 26.....75%
27 to 36.....72½%
Coppered:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 18.....72½&10&2½%
19 to 26.....75&10&5%
27 to 36.....75%
Tinned:
6 to 14.....75&10&2½%
15 to 18.....75&7½%
Annealed, Steel and Tinned, on Spools..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&5@60&10&5%
Brass, list Feb. 26, '96.....15%
Copper, list Feb. 26, '96.....25%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, '03.90&30@90&30&10%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&5@80&10%
Painted Screen Cloth, 100 ft., $1.10
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3¢
Nos. 4 and 5 Mesh, sq. ft..3½¢
No. 6 Mesh, sq. ft.....3½¢
No. 8 Mesh, sq. ft.....4¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ....75&10@75&10&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern.....70%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....40%
Adjustable S Pipe.....40%
Bemis Pipe.....60%
Briggs Pattern.....40%
Combination Black.....40&5%
Combination Bright.....40%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle .....50&10%
Elgin Wrenches, ₱ doz.....$6.25
Elgin Rethreading Attachment, one die, ₱ doz.....$6.25
Elgin Extra Dies, ₱ doz.....$3.00
Elgin Extra Jaws, ₱ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ₱ doz.....$2.10
Gem Pocket.....30%
Hercules 70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
Solid Handles, P., S. & W...50&10@60
Stillson 65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₱ gross, $7.50; ₱ doz.....$0.90

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ₱ doz.....$48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '02.....90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed..70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lbs., $8.00@8.25